THE IRON AGE

THURSDAY, NOVEMBER 1, 1888.

The Dean Blowing Engine.

We show on this page elevations and sections of a direct-acting blowing engine built by the Dean Bros. Steam Pump Works, of Indianapolis, Ind. It was specially designed for agitating oils, acids and chemical prepartions and has been being run at a high speed. Ten sizes are made, with steam cylinders ranging from 4 to 12 inches in diameter and air cylinders from 5¼ to 16 inches, the strokes varying from 7 to 18 inches. The engines are also claimed to make superior air pumps for condensing engines, working efficiently on either surface or jet condensers. Figs. 2 and 3 clearly show the principal features of the design.

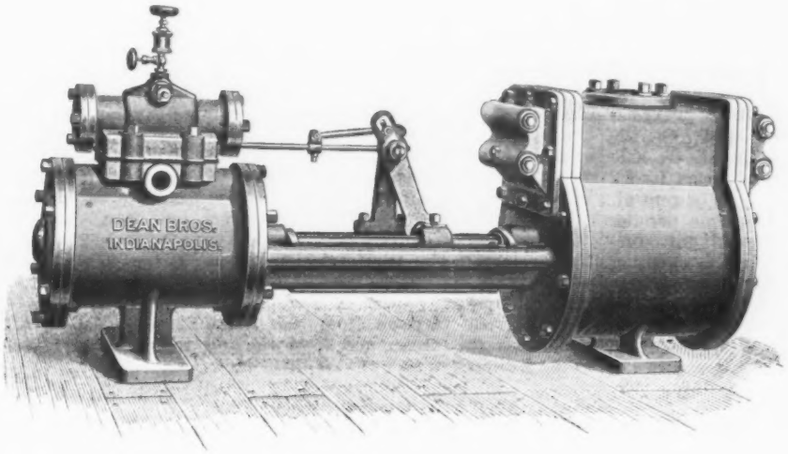


Fig. 1.—General View.

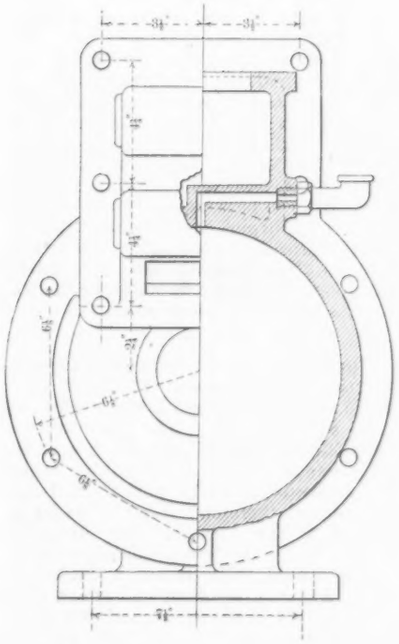


Fig. 2.—Vertical Section and Elevation of Air Cylinder.

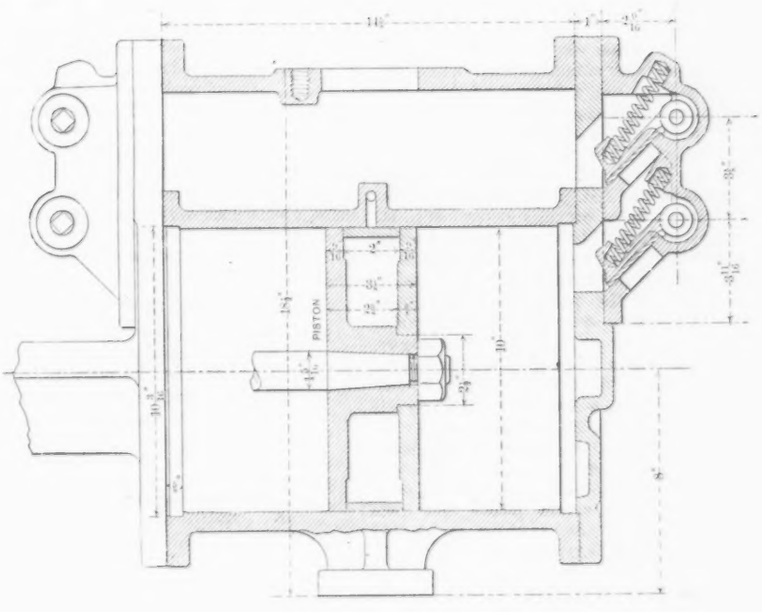


Fig. 3.—Longitudinal Section.

DIRECT-ACTING BLOWING ENGINE, BUILT BY THE DEAN BROS. STEAM PUMP WORKS, INDIANAPOLIS, IND

extensively used in cotton-seed oil works, where it has given excellent satisfaction. The stroke is adjustable, permitting the running of the air piston close to the cylinder head, and the space around the valves is very small, thereby expelling the greatest quantity of air possible from the cylinder at each stroke. The lubrication of the air cylinder is secured by delivering the oil directly into the cylinder over the crank of piston. The engine is capable of

Lately three cars came into the south yards, at Grand Rapids, Mich., bearing the official placard of the Custom House Department and consigned to the Gunn Hardware Company. These cars are the first that have arrived under such circumstanees, and contain plate tin direct from the manufacturers, in Wales.

Locomotive Draft Appliances.

The possibility of making the exhaust steam from the locomotive perform the work of creating the necessary draft and yet pass out under pressure light enough to prevent obstruction to the piston during the return stroke is at present receiving a great deal of attention from railroad men. In a recent article on the subject the *National Car and Locomotive Builder* remarks:

The ordinary combination of low double nozzles, lift pipe in the smoke-box, large cylindrical smoke-stack and diamond spark arrester has had its day, and nearly all progressive men who are striving intelligently to reduce the consumption of coal have found a more economical means

of creating draft. To stimulate the fire by drawing the necessary air through the grates, a certain smoke-box vacuum is required. Experience with ejectors and injectors has convinced engineers familiar with physical investigations that velocity of steam has less to do with creating a good vacuum than the proper adjustment of the mechanical appliances employed. Those who have experimented with different draft appliances and had the means of showing accurately the effect of different combinations have also been led to the same conclusion. The ejector principle is undoubtedly the true and proper line to work on for creating draft with low steam velocity, and the hope of some investigators who are now working up this subject is to find a nozzle arrangement that will create the necessary vacuum in the smoke-box, yet tend to form a vacuum in the cylinders instead of back pressure. It would be difficult to conceive of a more irrational arrangement for creating draft on the ejector principle than two nozzles set side by side passing columns of steam into a chimney with which neither can be central. That the arrangment ever became popular is astonishing, and its general introduction was possible only through economy of fuel receiving a little attention, and from the fact that methods of measuring the relative wastefulness of different ways of maintaining draft received practically no attention. It was a very loose way of deciding on the merits of anything new applied to the engine, to ask the engineer how it worked. Many a good thing has been unjustly condemned, and many a worthless appliance temporarily prospered by such unbusiness-like methods.

The mechanical departments of several railroads are trying exhaust-pipes designed after the pattern used by Mr. F. W. Webb, London and Northwestern Railway. There has been no difficulty in making all the steam needed when this nozzle was in use, but most of those who have applied it have made their exhaust-pipe too small for boring out to the large size admissible with this means of fanning the fire. Mr. J. N. Barr, of the Chicago, Milwaukee and St. Paul, is experimenting with nozzles on the ejector form. He has got sectional drawings of the leading ejectors and injectors, and is trying draft appliances adjusted as nearly as possible according to the proportions that have worked so successfully in raising water and in expelling air. Mr. W. W. Sprague, general foreman of the Chicago, Rock Island and Pacific repair shops at Chicago, designed a single annular nozzle which has given remarkably good results. He passes the steam into a globular chamber which surrounds a pipe like a lift-pipe, and which performs the same functions. The steam passes out from the chamber by an annular nozzle 14 inches diameter surrounding the central pipe. The total area of the nozzle was equal to that of a round nozzle over 6 inches diameter, and it gave a higher smoke-box vacuum than the 3-inch double nozzles used on the road. Mr. F. C. Smith, Peoria, Decatur and Evansville, has also been working on an annular nozzle in combination with an improved form of exhaust-pipe, with which he hopes to effect a slight vacuum in the cylinder instead of the back pressure that exerts such a prejudicial influence on the working of many locomotives.

The Bergen, a screw ferry-boat built for the Hoboken Land and Improvement Company, and to run between New York City and Hoboken, was launched on Thursday, at Newburg, from the shipyard of Thomas Marvel & Co. She has a cast-steel propeller-wheel at each end, instead of the customary paddle-wheels. Each wheel is 8 feet in diameter, and the two will be used whichever way the boat goes. We would repeat here that the boat will have triple-expansion engines built at the Delamater Iron Works, of New York, and will, accordingly, carry a very high steam pressure, never before tried on ferry-boats. It is of interest to note, also, that boats with propellers at each end have previously been used on the Detroit River, one having been built last year at St. Ignace, Mich.

Steel Rails in England and the United States.

J. Schoenhof, who is Consul at Tunstall, and who has obtained a good deal of notoriety through his efforts to show what is the cost of making iron, has added another contribution of the same kind. The Department of State has issued a special report, No. 49, which contains this document. As usual, it is an attempt, more or less successful, to guess at costs on the basis of partial or incomplete data. We quote from it the following:

In England the manufacture of steel rails has almost entirely been removed to the seashore. The transportation of the ores, as well as the transportation of the finished rails for export is, therefore, reduced to one carriage from the ocean steamers to the furnace and from the mill to the steamers, with but very little intervening additional expense. Large steel works situated in Sheffield, where I had expected to obtain information on the subject, had removed their rail mills to Workington on the west coast of England. Middlesboro' and neighborhood towns on the Tees are large producers of steel rails. Here the advantages for shipping and receiving are very great. The ocean steamers are wharfed alongside the works and the unloading and reloading on trucks are all the intermediate labor and expense required. The native ores for basic steel are not far distant. The Durham coal fields supply coke at a comparatively small transportation expense, according to the distance, from 2/ to 3/. The foreign ores are brought to the wharf close to the furnace, and so all advantages are made use of to save where alone savings are obtainable in the elimination of distance by judicious locating.

PIG IRON.

As to mining in the Cleveland district, the ore is of a soft nature and easily mined; it is of 31 to 32 per cent. Some of the mining is surface mining and other by shafts. A miner can mine easily 5 tons a day, working eight hours, for which he gets 10d. a ton. In very rich seams they mine as much as 6 to 7 tons. The employment is very regular, and 4/ a day is about the average for pretty nearly the whole year at the present time. The wages would be the same in bad times, too, only with the difference that the men would then have four or five days' work a week only. The differences in the labor cost in pig-iron making are caused principally by the quality of ore, the richer ores naturally requiring less wheeling, &c., to the ton of pig iron. The coke costs in Durham, put on cars, 8/, or $1.94 per ton; transportation to Middlesboro' average two-sixths, or 60 cents per ton; total, $2.54.

Cost of Cleveland Iron used for Basic Steel.

3¼ tons of ore at 4/ (96 cents).....	13/	$3.14
1 1-10 tons of coke at 10/6 ($2.55)....	11/6.6	2.80
3-5 ton of limestone at 3/6 (84 cents).	2/0.4	49
Labor.....	4/	97
Wear and tear, repairing, stores, &c.	2/	48
Office expenses, &c.....	/6	12
Total.....	33/1	$8.00

Hematite Iron.

The iron is Spanish ore, of 50 per cent., brought from Bilbao. Cost, 7/; freight, 6/6; total 13/6, or $3.28 per ton.

Cost of Iron for Bessemer Rails.

2 tons of Bilbao ore at 13/6.....	£1. 7/	$6.56
1 ton of coke at 10/6	10/6	2.55
2-5 ton of limestone at 3/6.	1/4½	33
Labor.....	3/3	79
Wear and tear, &c.....	2/	48
Office expenses, &c..	/6	12
Total.....	£2. 4/7½	$10.83

The four furnaces of the firm turned out in the week of November 12, 1887, which may serve as an average: Cleveland iron, 665 and 507 tons=1172 tons; and in two furnaces, hematite iron, 836½ tons. Total, 2008½ tons, at a cost in labor of £351. 19/2, or 3/6.1 per ton, equal to 85 cents. Of course it is not possible to exactly state the precise cost of labor of each species of iron made simultaneously in the different furnaces for which one general labor account is kept. The cost, as stated here, is pretty nearly the same as in other Middlesboro' furnaces. From the proprietor I have obtained a specified statement, a copy of the pay-roll of every laborer employed, and wages paid, which foot up as stated above. Other iron masters gave me the same cost, on inquiry. The statement of another firm is for four furnaces of 1674 tons only. Two of these turned out 744 tons, one 522 tons and one 408 tons. Ore, 3½ tons in Cleveland iron, 2 tons in hematite iron; coke, $1\frac{1}{10}$ tons in Cleveland iron, 1 ton in hematite iron; coal for calcining, $\frac{1}{10}$ ton; labor, 3/6, average; office expenses, rates, taxes, /9.

AMERICAN BLAST-FURNACE WORK.

The American furnaces are owned by the company manufacturing steel rails. They have eight furnaces, with an output per week of 3000 tons. The works are well managed and have all the modern improvements. The company makes the greater part of its own iron and uses about 30 per cent. of Cornwall iron in its output of steel rails. They use for their iron Cuban and European ore of 58 per cent. The quantities used per year are 60,000 tons from Cuba and 200,000 tons from Europe. The cost of ore per ton of pig iron is $11, or, at 58 per cent., $6.38 per ton at the furnace, against 2.90 of the same percentage of iron in the ore at Middlesboro'. Seventy-five cents duty added would still leave $2.73 to be accounted for as covering the freight surplus charge from Bilbao or North Africa to Philadelphia over freight cost to Middlesboro', and the inland transportation from tide-water to the furnace, a distance of about 80 miles.

THE FUEL.

The fuel is three-fourths coke and one-fourth anthracite coal. The coke costs $4.75 per ton, delivered at the works; the coal, $2.85 per ton. The coke at Connellsville was then $2 per ton, but at the later date of my visit in the coking region it had receded to $1.75, put on board cars, and would, therefore, stand at $4.50 delivered at the furnace. The difference would be in the transportation expense, which would seem rather a high rate. Coke, however, has been sold as low as 90 cents per ton at the ovens, and even at the present price is cheaper at the place of manufacture than at the ovens at Durham, where the English coke is obtained.

LABOR COST IN PIG IRON IN AMERICA (EASTERN PENNSYLVANIA).

The furnaces are worked by two shifts of 12 hours each. Each shift is composed of 16 men, or 32 men for the 24 hours on each furnace—in all 256 men for the eight furnaces, which is per man, at the 3000 tons weekly output, 11.72 tons. The boss men are paid from $1.65 to $1.75 per day, the furnace men $1.30 per day, and ordinary laborers, &c., $1.16 per day. The average of all employed is $1.30 per day. The seven days at $1.30 make $9.10 per man. We have therefore to arrive at the cost of furnace work per ton by $256 \times \$9.10 = \frac{\$2,329.60}{3,000}$, which gives 77.65 cents as cov-

ering all furnace labor expense of making a ton of pig iron. The general labor cost was given me by the president as $1.25, which leaves, therefore, a margin of 47.35 cents for all incidental and yard labor of handling ore, coke, coal and iron, unloading and loading, not included in the direct furnace work. The general expense is given me as 12 cents per ton; sundries, supplies, electric light, &c., as 50 cents per ton—in both instances about the same as in the English account Taking the different items, then, we have the following positions in Bessemer pig iron in Eastern Pennsylvania, made of Spanish and Cuban ores, against English iron of the same class.

	Eastern Pennsylvania.	Middlesboro'.
Ore	$11.00	$6.56
Limestone	.40	.33
Fuel	4.50	2.55
Labor	1.25	.79
General expense	.12	.12
Sundries	.50	.48
Total	$17.77	$10.83

It will be seen that the only marked differences lie in the ore and fuel account, due to causes explained above.

COST OF MANUFACTURING BESSEMER STEEL RAILS IN ENGLAND.

The steel mill from which I have taken this account works in shifts of 12 hours. They make 40 charges per day, have two converters, and turn out 7 to 8 tons in each heat. The weekly output is 1500 tons, and the number of men employed is 600. The weekly pay-roll is £950. The average cost of labor per ton is therefore 12/8, or $3.07 per ton. The several items in this sum stand as follows:

	s.	d.	
Labor in converting	3	6	$0.85
Labor in rail-making from the ingots	8	0	1.94
Additional labor	1	0	.24
Total	12	6	$3.03

The cost of pig iron is taken as 45/ per ton; spiegeleisen, 80/ per ton.

	s.	d.	
It takes 1 1-10 tons of hematite iron at 45/	49	6	$12.38
It takes 1¼ cwt. of spiegeleisen iron at 4/	6	0	1.44
It takes 14 cwt. of coal at 7/6 per ton	5	3	1.36
Labor	12	8	3.07
Total	73	5	$18.15

The present price of steel rails is £3. 17/6. This leaves no margin for profit, and barely enough to cover the charges. asking whether the 4/1 between the selling price and cost price could not be considered in the light of a profit, I was answered: "Should we make the sum of 4/1 profit we should be pleased. It is a long time since railmakers could see a certainty of 4/ per ton." It must be understood that this is about the lowest price steel rails have ever reached in England, and it is the general expression that it is hard work now to get a new dollar for an old one. That the price is not a paying one can be seen from the favorable consideration which is given by English manufacturers to the proposal of German rail manufacturers to revive the old steel-rail combination, which has in view the raising of the price and the parceling out of the output and the trade between the English, German and Belgium manufacturers. The wages are, for fitters, turners, roll-turners and bricklayers, 5/6, or $1.34 per day; for smiths, enginemen and joiners, 5/, or $1.22 per day; for men at rolls and furnaces, average 7/, or $1.70 per day, and for outside men, 4/, or 97 cents.

COST OF BASIC STEEL RAILS.

The mill is one which, in the opinion of ironmasters, is supplied with the best improvements, and equal to the best American mills in labor-saving arrangements, &c. I cannot say that in going over it I came to a like conclusion. I find the American rail mills which I have seen far ahead in improvement and the introduction of labor-saving devices over any at least that have come within the scope of my present observation in England. On the whole, it is conceded willingly by English makers that America surpasses them in the output and improved methods of manufacture. The iron used in this steel is Cleveland pig, but the cheaper price per ton is balanced by the greater amount of iron required for a ton of rails. About 800 men are employed, who draw in weekly wages (the week for which the account stands) £1294. 1/6, or $6276, equal to $7.84 per day, or per ton, 10/9½, or $2.62. The account is as follows:

	s.	d.	
1.3110 tons of pig iron at 33/4	43	8¼	$10.62
.1410 tons of ferromanganese (spiegeleisen) and hematite	9	10¼	2.40
Fuel	5	4	1.30
Labor (converting, 4/4; rail-making, 5/11)	10	3	2.49
Additionals	8	10½	2.16
Total	78	0	$18.97

The additionals are given me as being in reality 9/9, or $2.37, in excess of the other account. Labor items like bricklaying, &c., contained in the labor account of the hematite rail mill are here contained in the additionals, the difference between 10/3 and 10/9½, or 6½d. = 13 cents. The greater part of this sum, 9/9½, however, is offset by the credit deduction for value of ends and defectives. The "additionals" are higher in basic than in Bessemer steel. In this sum, royalty, lime, limestone, tar, refractories, castings and sundry stores and purchases for maintenance are contained.

THE AMERICAN COST OF MAKING BESSEMER STEEL RAILS.

The time when this inquiry was made in America was in 1887, a year of high prices. Steel rails had sold during the year at prices ranging from $40 to $32—during the greater part of the year being very close to the former sum named. At the time of my visit, in December, they were about the last named price. During the year wages were raised twice, each time 10 per cent. Whether these advances are still in force, I cannot tell. It is very doubtful, however, in view of the fact that steel rails are quoted now at $28.50 f.o.b., to $29, which is barely $10 above the English price—a price likely to be advanced at a very early day as being unremunerative to the makers.

The weekly output is 4500 tons. The mill has four converters, but only three working. The men at the converters work in three shifts of 8 hours each, the rail-making employees two shifts at 12 hours each. In all, 1048 men are employed in the steel works. The pay-roll for the month was about $57,000. This is $54.38 per man per month, and at 25 working days, $2.17½ per day and $13.05 per week—about two-thirds more than the average English wages in steel mills. If we divide the amount of money paid for labor over the output, however, we shall find no such difference to exist, as these higher earnings might leave people to suppose. The weekly wages of the month of fairly even distribution of work over each week and steady employment of the men stand as $13,680, and the output of 4500 tons gives us labor cost per ton thereof $3.04 of all moneys paid out on this heading.

Salaries and expenses were stated at 50 cents per ton. On an output of 225,000 tons, $112,000 for years of equally full output. The general labor cost was stated to me as $3.85 per ton. I cannot well understand what items these additional 84 cents would comprise, as the outlays for wages of $56,000 to $58,000, I was told, cover all labor employed at the steel works. I give this as received and leave closer analysis to a future re-examination of the details. The different items of cost are composed of the following factors as given from the mill account:

Items of Cost in 1 Ton of Steel Rails in Eastern Pennsylvania.

1 ton of pig iron	$18.00
3 cwt. spiegeleisen	4.00
Fuel	2.00
Labor	3.04
Sundries	.50
Additional labor (unexplained)	.84
Total	$28.38

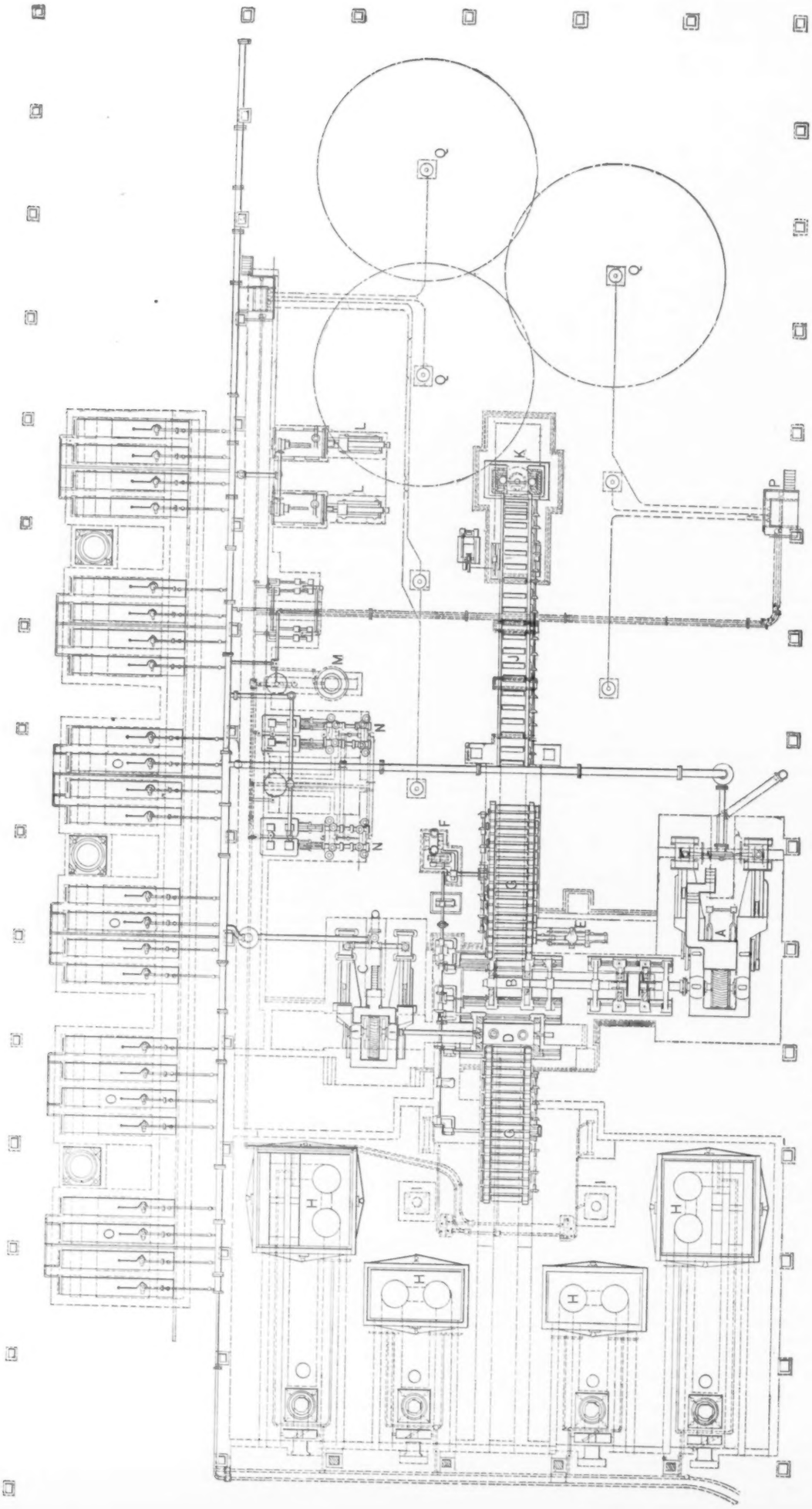
At $27 a ton for spiegeleisen, the above $4 represents 3 cwt. against 1½ cwt. in the English statement, which is balanced by 1 cwt. more of iron used in the Middlesboro' account, there is, therefore, in this account ½ cwt. more used than in the English mill. With $3 of spiegeleisen 1 1/10 tons of iron and $2 worth of scraps are used, and with $4 of spiegeleisen 1 ton of iron is said to be sufficient. While the English only use in all 1.175 tons of weight, this account would give us 1.30 tons of weight per ton of rails, which, if correct, would need further explanation than I can give at the present writing. At any rate, the difference in the weight would be returned again, or approximately so, in the value of scrap, ends, or misfits.

On the whole, it will need no demonstration to show what has been intimated in the opening pages of this report, that the differences in the labor cost, not alone of steel making, are not very great and come very nearly the English cost, but also in the materials used in its production. The difference of cost lies mainly in the transportation expense of the component parts of pig-iron used in the manufacture of Bessemer steel. The relative positions in steel-rail making, as well as the fact of high wages, compatible with relatively cheap cost, may be realized from the comparative statement of the output of the two mills, which gave the subject of this report: Tons of Bessemer steel rails turned out per week in a steel mill in eastern Pennsylvania, 4500; total number of men employed, 1048; output of tons per man employed, 4.3; average wages per day, $2.17½; labor cost per ton of all employed in steel mill, $3.04; tons of Bessemer steel rails turned out per week in a steel mill in England, 1500; total number of men employed, 600; output of tons per man employed, 2.5; average wages per day, 5/6 = $1.33; labor cost per ton of all employed in steel mill, 11/6 to 12/8 = $2.80 to $3.08.

[We have no means of checking the accuracy of Mr. Schoenhof's figures so far as they relate to English works. But they are certainly very untrustworthy where they deal with American works. The establishment referred to in Eastern Pennsylvania is obviously the Bethlehem mill. Nominally this concern has eight furnaces. In reality, one is practically abandoned, and for a long time, since the beginning of the present year, only six have been at work. In round figures, the capacity of the seven active furnaces—taking their work over a long period—is 2850 gross tons, so that Mr Schoenhof's reckoning is much out of the way. The figures in fuel are wrong, and the cost of ore is too low. The estimates of cost of producing rails at Bethlehem are certainly incorrect, because no sufficient allowance is made for waste. Yet we expect to have Mr. Schoenhof's latest guessing paraded before an admiring public as unquestioned statements of fact.—*Editor.*]

The four oscillating engines of the steamship Great Eastern, used for driving the paddle-wheels, had 72-inch cylinders and a 14-foot stroke.

The Pittsburgh steel-cast gun has been tested at the proving ground, but no official report of the firing has been received at the Navy Department.



GENERAL PLAN OF SLABBING MILL, CARNEGIE, PHIPPS & CO., HOMESTEAD STEEL WORKS.

The Homestead Steel Works.

We question whether during the past few years any single iron working establishment in the United States has developed more rapidly than the Homestead Steel Works of Carnegie, Phipps & Co., near Pittsburgh, nor are there many which can compare with it for ponderous machinery and the latest features in American practice. In some departments it occupies an exceptional position. Originally a rail mill, equipped with two small converters, it has expanded in a few years to the largest works for the manufacture of plates and structural material in the country. How rapidly some of the improvements were called into being may be understood when we state that possession was taken of that part of the ground on which the open-hearth works, plate mill and slabbing mill now stand, on the 26th of April, 1886. On the 14th of October in the same year the first of the open-hearth furnaces was in operation. It is particularly with these later parts of the plant with which we propose to deal, presenting in succession drawings thereof. The nucleus of the works were the mill of the Pittsburgh Bessemer Steel Company, consisting of two 5-ton converters, which made their first blow on March 19, 1881, and a 30-inch blooming train, and a 23-inch rail and billet train on which the first rail was rolled on the 9th of August of the same year. In times of great activity in the rail trade, this part of the works has produced rails, but its main work is to furnish mild Bessemer steel for the structural shapes rolled by the company. The greater part of the product of the open-hearth furnaces is used in the manufacture of plates.

THE SLABBING MILL.

We present a plan of the new slabbing and armor-plate mill. It is a building 300 x 120 feet, and a 35-foot lean-to for the boilers. The plant consists of eight vertical heating furnaces, H, 6 feet diameter in the clear, and a circular roof, the ring casting of which is of steel. They are grouped in the manner shown in our engraving. The two hydraulic charging cranes I are of the Aiken type, with a capacity of 35 tons. The main cylinder is 20 inches in diameter, with 13½-foot stroke, the hight of the crane from the floor line to the bottom of the chord being 34 feet, while the swing has a 20-foot radius. The crane is swung by means of rack and pinion, the hydraulic cylinder having a 6-foot stroke and an 8-inch diameter. A small hydraulic cylinder at the end of the jib is used to grip the ingots by means of a very ingenious and simple tackle. The slabbing train itself consists of two sets of rolls, one of vertical steel rolls, D, 20 inches in diameter, driven by a special E. P. Allis reversing engine, 30 x 54 inches, C, and one pair of horizontal rolls, B, 32 inches in diameter, 60 inches long, driven by a pair of 40 x 54-inch E. P. Allis reversing engines, A, with power tables, G G. This train we shall describe and illustrate in detail in a future issue of *The Iron Age*. This train has already dealt with ingots 36 x 48 inches, weighing 38,000 pounds, and is capable of handling 25-ton ingots, 48 x 54 inches. The table rollers, all steel, are driven by the special engine F, a 10 x 12 Crane make.

The slabs are delivered to the table J, 74 feet long, the rollers being driven by a special engine, as shown. The slabs are sheared by a 3000-ton shear, K, details of which were published in a recent issue. At the time of our visit a gauge was being attached to the shear-table, to allow of the slabs being sheared to exact dimensions without taking any measurements. The shear is served by two pressure pumps, L, the largest of their kind, built by the Southwark Foundry, of Philadelphia. They have a 65-inch steam cylinder, a 10-inch water cylinder and 8-foot stroke, and are worked at a steam pressure of 175 pounds, and are capable of yielding a water pressure of 4000 pounds per square inch. The general hydraulic service of the mill is supplied by two Wilson-Snyder duplex pumps, N, with 8 x 18 inch plungers, and an accumulator. Steam is furnished by six batteries of boilers, O, 44½ inches in diameter and 26½ feet long, the fronts having been built by Carnegie, Phipps & Co.

The crane service includes the two 35-ton charging cranes I, already alluded to, built by the Keystone Bridge Company; two 16-ton slab cranes, also built by the Keystone Bridge Company, and seven 5-ton slab cranes, built by the Southwark Foundry. At the time of our visit a line of 5-ton and 16-ton cranes was being placed along the outside of the building for handling and storing slabs.

Aside from the ponderous character of the machinery in this slabbing mill, and its spacious dimensions, the principal point which is sure to strike the visiting ironmaster is the small number of men in so large a plant.

THE OPEN-HEARTH PLANT.

The open-hearth plant comprises four furnaces, No. 1 being a 15-ton basic; No. 4, a 20-ton basic, and Nos. 2 and 3, 40-ton acid furnaces. The latter have taken a maximum charge of 88,400 pounds, their average charge being 65,000 to 70,000 pounds. The furnaces are circular, using natural gas, the stack being placed back of the furnaces, with checker-work for preheating the air in the flues. On each side of these flues are narrow cooling flues. The furnaces are so placed that the charging is done from the general floor level, the steel being cast into a ladle, mounted on a central ladle crane capable of taking 40 tons of fluid metal, so that castings up to 100 tons can be made by casting from two or more furnaces. On either side of the ladle-crane are two semicircular casting pits, only a few feet below the general level, each pit taking four groups of molds, bottom casting being generally employed. The pits are flanked by 5-ton ingot cranes, four of which command the furnace itself, the ladle-pit and the casting-pits. There are 16 of these ingot cranes. At one end of the melting-shop a small steel foundry has been equipped with core-room, &c. A large number of castings have been made, among them some very large ones, already alluded to in *The Iron Age*. Near it a plant has been put in for making basic material, including a Gates crusher, a mixer and a calcining cupola.

THE PLATE TRAIN.

The plate train is housed in the same building with the open-hearth steel furnaces; the total length of the structure being 967 feet, with an 86-foot main span, and two 45-foot lean-tos. The train is served by six heating furnaces of special design, placed in two groups of three with their working doors in front of a circle. Their principal feature is that the ports are so designed that the entire hearth surface, 25 feet 1 inch by 6 feet 9 inches, is available for heating. Like in the open-hearth furnaces, the checker work is in horizontal flues, surrounded by air-cooling flues, the reversing valve being back of the chimney. The two semicircles of heating furnaces are commanded by two cranes, the ingenious arrangement of which quickly attracts attention. All the movements are controlled by one man perched on a seat facing four levers near the end of the jib. By means of a hydraulic cylinder he can grip the slab, with the aid of another controls the forward and backward movements of the car on which he is seated, and can thus deposit the slab within the range of the crane; by means of a third lever he can raise and lower the jib, and with the aid of a fourth can work the rack and pinion which swings the crane. Their operation is exceedingly rapid and precise, and they have been the means of very materially increasing the capacity of the mill. We may mention that they have a reach of 44 feet to the back of the furnace. The plate train itself is three-high, with 32 inch top and bottom, and 24 middle roll; their width being 119 inches. On the roller's side it has one stationary table, 17 feet 10 inches long, followed by a feed table 30 feet long. A similar table is on the catcher's side. The train is driven by a 42 x 54 inch Mackintosh-Hemphill engine, with a 27½-foot fly-wheel, weighing 35 tons. It is served by a hand-roll crane on each side. The table on the catcher's side is followed by a table 22½ feet long, and then the plate is carried on to a series of tables aggregating in length 350 feet to the shears. By rollers driven by a special 8 x 12 engine, the finished plates are thus carried along slowly to the shears. The influence of this arrangement upon the quality of the plates and its convenience and economy of labor can hardly be overrated. Instead of being piled upon one another as soon as rolled, to cool irregularly, as accident may dictate, with the buckling and internal strains thus created, the plates cool gradually and uniformly. Ample time is afforded to mark them for shearing, for inspecting them carefully, for marking the position of the test pieces, &c. All this is accomplished with a minimum of labor.

Returning to the plate mill proper, we may note that it is equipped with two 6 x 18 feed pumps and three Southwark pressure pumps with 9-inch plunger and 18-inch stroke. Steam is furnished by four batteries of boilers connected with two stacks.

The plate traveling along the tables referred to reaches the shears, of which there are five, three large shears built by the Morgan Engineering Company, one scrapping shear and a trimming shear. In order to permit of easy and rapid handling, numerous casters are grouped about the shears, and from one to the other, and to a very simple and efficient scale arrangement. A platform resting upon a hydraulic cylinder is raised to carry the plates slightly above the level of the casters, and thus the weight is registered. There are in the shear department 13 5-ton cranes, and eight new ones are being put in along the outside of the building to facilitate shipping and stocking plates.

At the time of our visit there were lying ready for shipment four plates of exceptional size, which may serve to illustrate the capacity of the plant to turn out heavy work. These plates were 2 inches thick and 108 x 120 inches, their weight being 7000 pounds.

Reviewing the equipment, it will be noted that it possesses exceptional, and, we may say unrivaled, facilities for handling heavy plates and for putting work into the steel. The slabbing train through its construction secures a thorough working of the sides of the ingot.

We may mention here that it is the plan of the management to use the train also for rolling octagonal shapes so that heavy shafting will become a specialty of the works. In rolling plates the slabs are cut into such lengths that the first reductions in the plate mill are made by rolling in a direction normal to that in which the steel was worked in slabbing. Thus the material is worked in both directions and the distinction of tests in the direction of rolling and vertically to it lose much of their force, if, in fact, it does not entirely disappear. An incidental advantage of this method, costly though it may be in the way of investment in plant, is the reduction in the amount of scrap made.

Another striking characteristic of the works is the economy in labor. Practically the trains are automatic and the handling is reduced to a minimum. The facilities for the shipment of goods, with the additions to the crane service now being completed, are exceptional, and place the company in a position to fill orders within a very brief time.

The New Navy.

In briefly reviewing the work on the new ships of the navy, the *Army and Navy Journal* says:

The work on the Chicago still continues at the New York yard, and it is hardly probable that she will be put in commission much before the first of next year. The double-turreted monitor Amphitrite was lately taken out of the dock at Wilmington, Del. Her bottom has been painted and otherwise fixed up. The department has as yet reached no decision as to whether the ship will be rebuilt at a private yard or at some navy yard. The new cruiser Charleston, now building at San Francisco, Cal., will be completed about January 1, the contract time, as the department is in receipt of reports from the contractors saying that the work is progressing very rapidly, and that the ship will be turned over to the Government at the time specified. Of course she will be assigned to the Pacific station, and will be the flagship.

The Philadelphia *Inquirer* says: "The Philadelphia, it is expected, will beat the Baltimore in speed, as Messrs. Cramp will supply their own engines to the former, whereas the firm of Humphreys & Tennants; England, will provide the motive power for the latter. In the one case Messrs. Cramp guarantee a speed of 19 knots; in the other they only guarantee horse-power. It will be interesting to compare the work of the two sets of engines when both vessels are in commission. The model of the Philadelphia, although an English design, is considered by the Messrs. Cramp to be a very good one, and capable of but little improvement in view of the work the vessel will have to perform. The dynamite cruiser Vesuvius was sent down the river, October 1, to try how the engines worked. The affair was kept very quiet, only a privileged few being notified of the event. So far as could be learned, the trial was a most successful one, the vessel showing extraordinary speed, making a run of 13½ miles in 29 minutes, being an estimated speed of nearly 27 miles an hour. As the guaranteed speed is only 20 knots an hour, this, if correct, is eminently satisfactory. Allowance has, however, to be made for the tide, which would deduct about two knots off the record, but even then the result exceeds the expectations of the builders."

We learn that everything worked well on this trial. There was no heating of journals and no leaks anywhere and very little vibration. Two hundred and forty revolutions were reached without effort, but no measurements of speed were taken, as the trial was only made to find defects in the engines, if any existed. One of the builders has written to an officer of the War Department that a speed of 20 knots was obtained with a pressure of only 135 pounds. All indications point to additional speed when the full working pressure of 180 pounds is put on, and it is then expected fully 23 knots will be made.

In the naval appropriation bill, approved September 7, 1888, provision was made for the construction of seven new vessels, and an appropriation of $5,550,000 was made, and an additional appropriation of $260,000 for a composite ship to be used as a practice vessel for the midshipmen at the Naval Academy. Secretary Whitney has now under consideration a number of designs for these new ships, and as soon as the designs are adopted, work will be immediately started on the plans and specifications, and the contracts awarded.

Tests of Rivet Steel.

In the course of an interview, published in the New York *World* on September 21, Commander R. D. Evans is quoted as saying, in illustration of an alleged improvement in the quality of steel furnished as the result of the operations of the Navy Department during the past few years:

When the first contracts were made by the present administration of the Navy Department it was considered exceedingly doubtful if rivets, or rivet stuff, showing an elongation of 30 per cent. in 8 inches and an ultimate strength of 50,000 pounds per inch could be obtained in this country. Such material was finally made by what is known as the Clapp-Griffith process by firms in Pittsburgh, and it created comment all over the professional world. Under the present contract for the Maine and the specifications furnished by the Navy Department, the rivet material averages 33 per cent. elongation in 8 inches, and an average ultimate strength of 56,000 pounds per square inch. Such material as this at the time of the original contracts, or the first contracts made by the present administration of the Navy Department, would have been considered absolutely impossible.

The choice of this particular example by Commander Evans was unfortunate, since there are on record figures proving that steel rivets of high quality were made for the navy prior to the time stated. We have before us a report by Prof. W. H. Burr, of the mechanical laboratory of the Rensselaer Polytechnic Institute, at Troy, dated November 23, 1883, which contains the following series of tests:

Number of specimens.	Diameter of specimens in inches.	Pounds of stress per square inch at		Per cent. of final stretch in 8 inches.
		Elastic limit.	Ultimate resistance.	
2.....	0.73	40.100	62.600	26
3.....	0.74	37.200	62.300	28
4.....	0.734	37.800	60.500	30
5.....	0.728	38.500	61.100	28
6.....	0.73	37.300	61.200	29
7.....	0.73	37.300	62.100	25
8.....	0.734	36.900	61.500	31
9.....	0.725	43.100	70.700	26
10.....	0.73	42.200	60.200	29
11.....	0.73	39.600	63.500	30
12.....	0.73	39.600	60.200	30
13.....	0.726	39.100	61.300	27
14.....	0.73	37.300	58.800	30
15.....	0.725	38.700	60.500	31
16.....	0.729	39.300	61.400	31
17.....	0.734	37.840	61.450	29
18.....	0.724	38.350	61.200	32
19.....	0.725	38.700	61.500	27
20.....	0.725	37.300	61.240	30
21.....	0.726	38.900	62.300	28
22.....	0.725	38.740	62.000	28
23.....	0.73	39.000	60.200	30
24.....	0.73	37.500	60.200	27
25.....	0.73	39.200	61.200	28
26.....	0.73	37.300	61.100	26
27.....	0.725	38.740	62.200	25
28.....	0.73	39.600	59.200	29
29.....	0.73	41.050	64.440	28
30.....	0.73	38.200	60.200	28
31.....	0.73	37.300	61.200	28
32.....	0.73	38.400	60.200	30

The specifications called for an ultimate tensile strength of at least 60,000 pounds, and a final elongation in 8 inches of not less than 23 per cent. An excess over 60,000 pounds was allowed, provided the ductility remained at least 23 per cent.

Heating Rolls by Gas.—London *Engineering* illustrates and describes a device for heating rolling mill rolls by gas. The latter is burned in jets, which are uniformly distributed the whole length of the rolls at each side. When these jets are lighted and the machine is put into slow rotation, every part of each roll is gradually and uniformly heated without the production of any dangerous strains. This method of heating rolls we understand is in use by Messrs. Bolckow, Vaughan & Co., the Dowlais Iron Company and the Steel Company, of Scotland. In one mill the average life of the rolls previous to the application of the gas was 79⅝ days, and, after the application, 342 days. In another large plate mill, with rolls 36 inches by 9 feet, and weighing each 17 tons, two rolls only have been broken, and both cases were due to the neglect of the men in charge in not turning on the gas. Even these rolls ran 342 days each. The device is the invention of Mr. Franklin Hilton, of Middlesboro'-on-Tees.

Cost of Iron Making at Troy.

During the course of the Burden trial at Troy, John H. Allen, expert accountant, testified as follows:

The books of the Burden Iron Company showed that in April, 1886, the quantity of Hudson River ore used in the mixture at the Burden works was 25 per cent. After that it was increased, until in January, 1887, it was 50 per cent., and it had remained at 50 per cent. ever since, down to September, 1888. The quantity of this ore received in 1885 by the Burden Iron Company was 56,080 tons, in 1886 it was 10,475 tons, and in 1887 it was 11,661 tons. The cost in 1885 was $3.11 $\frac{7}{10}$ per ton, and in 1886 it was $3.13 $\frac{9}{10}$. These figures show the cost of the ore laid down at the works. The average of pure metallic iron in the ore, as shown by the company's analysis book, was 45.54 per cent. in 1884, 43.26 per cent. in 1885 and 43.98 per cent. in 1886. The average cost of pig iron made by the Burden Iron Company in 1883 was $21.43. The output was 15,798½ tons. In 1884 the cost of pig iron made by the company was $18.33 per ton, and the output was 23,583½ tons; in 1885 the cost was $17.38 a ton, and the output was 13,578 tons; in 1886 the cost was $18.96½ a ton, and the output was 15,197 tons; in 1887 the cost was $19.17½ a ton, and the output was 9132 tons. January 1, 1885, there were 5496 tons of pig iron on hand, according to the inventory, and it was rated at $17.50 a ton. January 1, 1886, there were 8571 tons on hand, inventoried at $16 a ton. January 1, 1887, the inventory showed 7064 tons on hand, and the value was fixed at $16.50 a ton, and January 1, 1888, there were 6668 tons inventoried at $17 a ton. The cost of making iron at the Burden works this year was stated as follows: January, $18.20; February, $19; March, $18.94; April, $17.53; May, $20.61; June, $24.01; July, $23.36; August, $19.12; September. $17.09. Other figures were given showing the cost of pig iron other than that of the Hudson River company, with the intent to establish the allegation that as good a grade of ore could be laid down at the Burden works at a less figure than was paid the Hudson River company.

The channel span of the Chesapeake and Ohio bridge at Cincinnati was successfully connected on Saturday. Work is well along on the remaining shore span, and the company expect to be running their cars into Cincinnati by December. The railroad along the Ohio River, which connects with the bridge, is about completed, and will be turned over to the Chesapeake and Ohio in a few days.

The high railway speeds recently attained on several English roads show that where sufficient inducement offers modern railway appliances are capable of approaching very closely to the apparent limit of 1 mile a minute.

Riverside Iron Works, Wheeling.

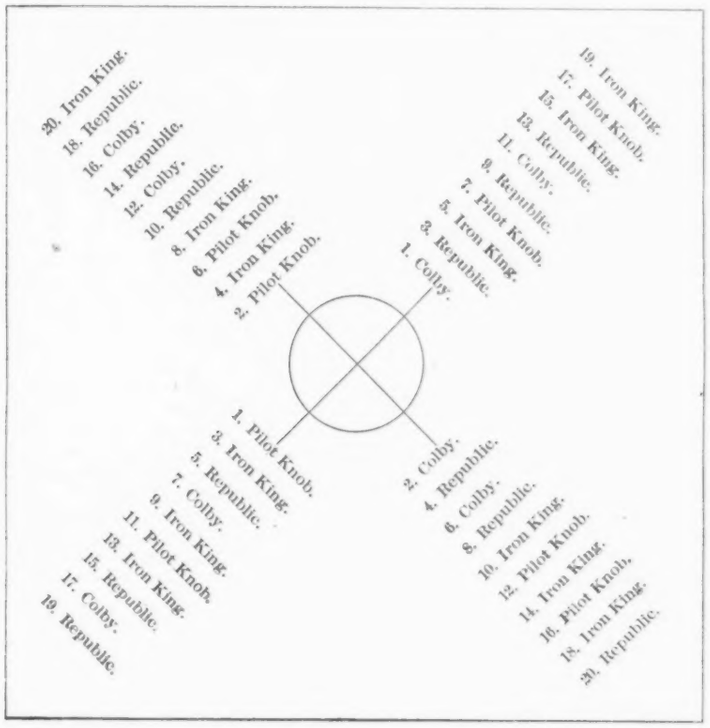
During a somewhat hurried visit to the Nail City, a representatiye of *The Iron Age* had occasion to inspect a part of the plant of one of the most important and progressive enterprises of Wheeling, the Riverside Iron Works. During the past few years its management has led in the momentous changes which have relegated puddled iron to an inferior position, and have won for Wheeling the distinction, of occupying beyond the question even of its rivals the position of arbiter of the cut-nail trade, and of shaping largely the course of the trade in soft-steel billets and slabs. To the Riverside Iron Works individually belongs the credit of leading in the substitution of soft steel for iron so far as nails, tubes and pipe are concerned.

THE RIVERSIDE FURNACE

is a 16 x 75 foot stack, with a 9-foot crucible and a 6-foot bell, the stockhouse being 90 x 175 feet, the stock being lifted by an Otis hoist. The ore used is Pilot Knob, Colby, Iron King and Republic, an ingenious system of charging having been adopted. The charging area is divided into four quarter sections. In order to properly distribute the fine ore the different classes of ore are charged in accordance with a schedule, a copy of which is framed under glass in the stockhouse and on the top, and appended herewith. Taking into account the fact that the Iron King and the Colby are the soft ores, while the Republic and the Pilot Knob are hard, it will be observed that the same even and odd numbers placed opposite one another are always soft on the one side and hard on the other. In order to prevent the uneven distribution of the stock, which grows out of the fact that the bell in descending swings in an arc, a part of the circle of which the length of its lever is the radius, a roller is provided which guides it vertically. The result of the system has been an increase in the life of the furnace, one campaign having given 83,000 tons on one lining and the last over 100,000 tons. The furnace is equipped with four Player hot blast stoves, yielding a blast temperature of 900° F. The blast is furnished by one I. P. Morris engine, with 36-inch steam cylinder, 7-foot-blowing cylinder and 6-foot stroke, and by a smaller Mackintosh, Hemphill & Co.'s engine, with 30-inch steam cylinder, 7-foot blowing cylinder and 4-foot stroke, the limit of pressure being 7 pounds. Steam is furnished by five batteries of 40-inch plain cylinder boilers, 52 feet long fed by a doctor. The smoke stack is 170 feet high by 9 feet diameter in the clear. The furnace has two cinder notches and an admirable arrangement for handling the cinder, being taken off laterally to a series of discharge troughs to the cinder cars, which are handled by a locomotive. The wall above the iron notch is cooled by four pipes entering the brick wall 18 inches. The casthouse is 170 x 55 feet. Near the furnace is a foundry in which all the castings for the plant are made, a machine shop and a carpenter shop.

THE STEEL WORKS

contain two five-ton converters, placed side by side before a 35-foot pit. The three 8-foot cupolas are located on one side of the pit and opposite to them is the crane for handling ladles and bottoms. The distinguishing feature of the plant is that the iron ladle is handled by an overhead Morgan crane, an arrangement which does away with troublesome gutters, and permits of pouring the iron without any waste whatever It has been found, however, that the dust naturally incident to Bessemer works has a prejudicial effect upon the crane machinery, causing delays and breakdowns through rapid wear. The overhead crane is also used to put on the bottoms. The two converters are served by one central ladle crane and an ingot crane, a hydraulic pusher being provided to strip ingots which have been stuck. The ingot crane deposits the ingots on trucks which are switched out of the works on to the track which takes them to the crane commanding the heating furnaces and the table of the blooming train. The plant which was built for a capacity of 100 tons of soft steel ingots per turn has far outstripped that figure, 191 tons of ingots having been made in one night shift recently, in 46 heats, which has been the highest record thus far. The slower cooling of mild steel, generally speaking, makes the pit capacity even more a factor than in rail steel work, and in the special case of the Riverside mill the crane service is somewhat inadequate toward handling output regularly so far beyond the first plans. The steel made ranges in carbon from 0.08 to 0.09 with 0.30 to 0.40 manganese, the ferromanganese being preheated.



The blooming train is a 26-inch Mackintosh, Hemphill & Co., driven by a 28 x 42 inch reversing engine by the same firm, and equipped with a shear by the same makers, the ingots rolled weighing about 3100 pounds. It is served by two heating furnaces and runs alternately on slabs and billets, being more than able to keep up with the converter capacity on the one and not quite with the other form.

In a line with the steel works is

THE NAIL PLATE AND SKELP MILL.

which contains a two-high 21-inch nail-plate train with three stands. It is now being changed to 3-high. It has a capacity of 80 tons in 24 hours and is equipped with two regenerative gas heating furnaces. The same engine, with 36-inch cylinders and 6-foot stroke, drives a three-high 21-inch skelp train, with three stands of rolls. The nail-plate train is served by three nail-plate shears, while the skelp train has two skelp shears and one nail-plate shear, all driven by a special engine, which runs also two grindstones and two roll lathes. The skelp train has two heating furnaces, which, like the others in the plate mill, are arranged to use either producer gas or natural gas. The nail-plate train handles about 20 heats in 24 hours, while the skelp train takes 14 heats, rolling skelp from 15¼ inch down to 5½ inch, the quantity being about 60 to 70 tons in 24 hours. At another mill in Wheeling, owned by the company, they have additional capacity to roll 65 tons skelp daily. The nail plate is conveyed to the nail factory of the company, which has the distinction of being the largest in the world, the number of machines being 224. A part of the steel skelp is sold in the open market, the greater part of it, however, being worked in

THE NEW TUBE MILL

of the company, the building of which for making steel tubes being a bold step in the direction of progress, which has been fully justified by success. We have repeatedly alluded to the quality of the product. Suffice it to say that a series of specimens are exhibited at the office at the mill, which show that not alone the material itself, but the weld, too, can endure exceptionally severe torture. So far as the material is concerned, we have during our visit seen pieces of the skelp taken at random among the pieces as they fell from the shears bent back and forward at right angles 14 times before the first signs of fracture appeared. Among the most interesting tests of the pipe itself were pieces of it plugged at both ends and then submitted, filled with water, to extreme cold. While iron pipe under identical conditions split, the steel pipe resisted the strain, the malleable iron plug giving way. In another case the end was welded up, and then only a slight bulge told of the strains to which the specimen had been submitted. The mill itself is a building 300 feet wide, in three spans, and 300 feet long, and has the necessary outbuildings, machine shop, blacksmith shop and store houses. In the lap-weld department, in which 8 inch down to 1¼ inch lap-welded pipe are made, there is one scarfing and bending furnace, and one welding furnace. At the time of our visit double extra heavy 4-inch pipe ¾-inch thick were being made there. In the butt-weld department there is one bending and two welding furnaces. The mill is equipped with hot and cold straightening machinery, hammers for welding couplings, tapering and tapping machines for couplings and threading machines for pipe, and hydraulic presses, every tube

sent out of the mill being tested by hydraulic pressure. The general arrangement of the plant is excellent, the skelp entering the mill on one end, and the finished pipe being delivered at the other end. They contemplate doubling their capacity in the near future.

So far as the use of mild steel as the material for pipes and tubes is concerned, its behavior during the different stages of manufacture is well calculated to remove any doubts in the minds of those who may have had occasion to watch the stock as it passes from one manipulation to the other. No split ends or imperfect welds were observed. In the butt-welding department the exact point where the half-finished tube had been gripped by the first die could be located by the weld, and throughout the markings for cutting off the end of the welded pipe were from less than 1 inch to about 3 inches from the rough end. This material has been found to be admirably suited to the manufacture of boiler tubes, one maker having purchased and used not less than 3000 tons during the past six months. One of the principal difficulties anticipated was that of threading the pipe. Unlike iron, which crumbles, the soft steel curls up in shavings, hugging the die closely, preventing thereby the oil from getting to the cutting edges of the dies. This difficulty has been overcome, to judge from the appearance of the threads on the piles of pipes which were lying ready at the mill for shipment.

Slipping at High Locomotive Speed.

Some ten years ago, says the *Railroad Gazette*, M. Rabeuf, an engineer on the Northern Railroad of France, noticed the slipping of locomotive drivers when running (and using steam) down grade, even without any train load to haul. He made several observations, and concluded that this slipping increased in some ratio to the speed, and that it was much greater at the same speed in descending than in ascending grades. He found, by measuring the distance run, and noting the number of revolutions made by the drivers in that distance, that the circumference of a driver multiplied by the number of revolutions, gave a product of from 13 to 25 per cent greater than the distance. That is, fuel was wasted and tires and rails worn out by useless revolutions of the drivers. Several explanations of the phenomenon observed by M. Rabeuf were offered at the time, and within a year M. Durand-Grêville has published in the *Revue Scientifique* the remarkable theory that in going down grade the wheels tend to get away from the rail by the amount of the vertical component of the motion of the locomotive, and in going up grade they tend to approach the rails by the same component. Hence, he reasons, there is less adhesion in going down grade and increased adhesion in going up. M. A. Stévart takes, in a recent issue of *L'Industrie Moderne*, space to state the theory of M. Rabeuf and the more or less ingenious explanations of it, and to show that these explanations are mechanical illusions. This he does very prettily, but one is surprised to find that after all the ingenuity and erudition which he has expended on the subject he accounts for the phenomenon by the simple and conclusive statement that it does not exist. M. Stévart says that he made numerous runs between Liége and Verviers, registering the revolutions of the drivers, and found "no appreciable difference between the measured distance and the development of the circumference of the drivers multiplied by the number of revolutions." The distance between these stations is about 14 miles, and the difference of altitude about 400 feet. Moreover, M. Stévart made various long runs at high speeds with coupling rods removed, and found no appreciable change in the relative positions of the crank-pins. He quotes various authorities, who sustain his position, that this particular kind of slipping does not occur. It seems probable that M. Rabeuf's figures were the result of the singular conditions under which he made his experiments, putting the reverse lever in full gear when running down grade.

The statement that engines slip continually while running at a full speed is often made, but almost invariably by persons of no practical experience, who appear to be unaware that any slip of the drivers can be instantly detected by an engine runner. Any one who has run a fast train knows that on entering a damp tunnel slipping occasionally occurs, but the vibration imparted to the engine is so peculiar that no one who has once felt it is likely to fail to recognize it again. Messrs. Abbey and Baldwin, when making some observations on the running of a Jersey Central express passenger engine on the Bound Brook route, found that the slip at high speed was practically *nil*. The wheels, as calculated from their diameter, should give 298.98 revolutions per mile. A counter showed that 298.62 revolutions per mile had been actually made, the difference being negative and only one-third of a revolution per mile, or within the limits of errors of observation. As these engines are run very hard and made to do their utmost, it might reasonably be expected that they would show slip, if any existed, at high speed. It is therefore reasonable to suppose that any continuous slipping at high speed is non-existent. The continuous slipping theory is supported by so very little evidence, either practical or theoretical, that it must take its place among the numerous other pseudo-scientific delusions.

German Prices for Steel Rails.

The *British Trade Journal* prints the following information concerning the prices obtained for steel rails by German makers. It shows very clearly that the German mills have everything to gain by a renewal of the international combination. They had a monopoly of the Government orders for rails according to the terms of the old agreement, were able to obtain an average price of £7 per ton, whereas, when the combination collapsed the price fell under the influence of Belgian and English competition, to £5. 8/. The following table shows the total of the Government contracts with the German works for the years enumerated, and the average price in each year at which the contracts have been accepted:

	Tons.	Average Price. £	s.	d.
1884–85	71,300	7	15	0
1885–86	75,970	7	6	0
1886–87	75,563	7	3	0
1887–88	74,321	6	6	4
1888–89	78,763	6	5	0

These prices, of course, do not represent the rates at which rails have been sold for export Last year, for instance, while the average interior price was £6. 6/4, the export price fell to £4. 12/. It is pointed out, however, that even if it declined to £4, the average of the export and interior prices realized by the German works would still show a comparatively good return. The following table shows the quantities exported and the average price for export in each of the past six years:

	Tons.	Price. £	s.	d.
1882	186,054	6	10	4
1883	176,177	5	10	0
1884	144,463	5	17	5
1885	164,799	5	10	7
1886	163,221	4	13	0
1887	174,226	4	12	0

The considerable differences in price will be observed.

American Forestry.

The annual report of the division of forestry, Department of Agriculture, recently issued, contains some very interesting information. From an inspection of the import statistics it appears that the import duty laid upon manufactured lumber in 1872 had the effect at first of decreasing importations from Canada by from 50 to 60 per cent. until 1876–77 when an upward tendency of imports began. A comparison of the imports of the last three years with those of the preceding three, however, shows a noticeable decline in all classes of foreign products from the amounts to which they had gradually increased up to 1884, when the importation of manufactured lumber reached nearly the same amount that was imported in 1872. "For the decrease in unmanufactured wood," said Mr. Fernow, "the Canadian export duty of $2 on logs may serve as an explanation, but other causes must have worked to effect the reduction of manufactured lumber in the face of a decided enhancement of value of product. The difficulty of access and increased distance from the market is probably the explanation." At the present stage of development, it is suggested that, so far as the saving of standing supplies is concerned, there need be no fear or hope from foreign competition, for the "quantity of standing pine in the United States and Canada is reduced to a condition of absolute control; it is held in strong hands on both sides, and will not be lightly frittered away." The stumpage price, it is predicted, which has lately advanced as never before, will necessitate the upholding of present values for manufactured lumber, and an advance of prices is as certain as a decrease of supplies. "An unbiased weighing of the arguments advanced on both sides," says the report, "leads to the conclusion that the removal of the tariff on lumber would have no appreciable effect upon the price to the consumer, nor be detrimental to the lumberman's or sawmill business, nor in the least affect the laboring man; but at the same time no appreciable benefit toward preservation of forests and forest supplies need be expected at this date from such removal." The report concludes with brief reviews of the condition of the forestry interest in each of the several States and Territories.

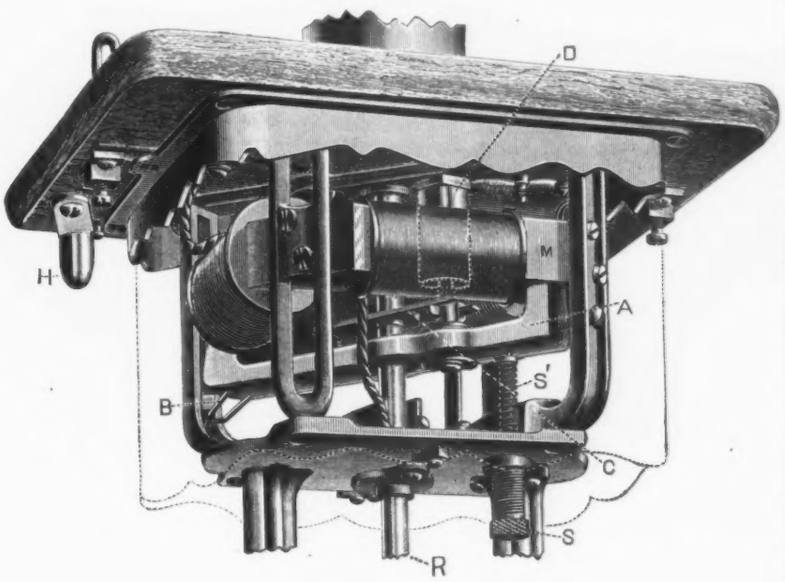
Oil at North Chicago.—The North Chicago Rolling Mill Company are now running 14 boilers at their South Chicago Works exclusively with oil for fuel. Thus far the results have been very satisfactory, but the managers of the company are not prepared as yet to express a definite opinion in regard to it. The oil is now being conveyed to the works in tanks, but a pipe line is contemplated from the South Chicago storage tanks, which will probably be built as soon as the tests now being made are pronounced conclusive. D. S. Mathias has been appointed superintendent of the South Chicago Works, to succeed J. W. McGinnis, who resigned a short time since.

The Phosphor Bronze Smelting Company, Limited, of Philadelphia, have issued a price list, No. 6, for October. It makes the price of Nos. 1 to 20 roll and sheet phosphor bronze, 2 to 6 inches wide 48 cents, which increases for higher numbers and greater widths. For phosphor bronze wire Nos. 1 to 16 the price is 50 cents a pound, for telegraph wire, Nos. 6 to 13, 35 cents; for telephone wire, Nos. 14 to 16, 45 cents; for ½ inch wire rope, 28 cents per foot, increasing to $1 per foot for 1 inch. These have 19 wires to the strand. Phosphor bronze wire-cloth, 2-

mesh No. 16 wire to 24 mesh No. 30 wire, is 50 cents per square foot. Cast bolts and nuts, ½ to 1 inch, are quoted 45 cents per pound, and a table of prices is given for wood screws.

The Waterhouse Arc Lamp.

The Waterhouse electric arc lamp, of which we present details on this page, embraces several novel and interesting features. The form of magnet differs from all other arc lamp magnets. The lifting mechanism is free from friction, and owing to the simplicity of construction does not require expert care. Only one adjustment is necessary. The magnet is in the shape of quadrangle with four poles, two of them of constant and two of variable polarity. Under the variable poles is pivoted the armature A, which is held in position when



THE WATERHOUSE ARC LAMP.

no current is passing through the lamp by the supports B and the spring S′. The tension of the spring S′ is changed by means of the screw S, so that more or less assistance can be given to the armature A by the spring S′ as may be necessary to form the proper arc. Attached to the armature A is the clutch C, through which the carbon rod R is inserted, and it will be noticed that the air dash pot D is also connected to armature A, and any sudden motion of the armature upward is opposed by the dash pot D, or downward by the spring S′.

The current coming to the lamp enters at the terminal near the handle H, passes around the coarse wire coils on the magnet M, then to the carbon rod R, through the carbons and returns to the opposite terminal of the lamp, when it passes out on a conductor to the next. The current flowing around the main coils produces magnetism in the poles of the magnet M and draws up the tongue of the armature A into the elongated hole in the magnet M, and also lifts the armature A from the supports B. Drawing up the armature A actuates the clutch, which lifts the carbon rod R, and it in turn raises the upper carbon, and the arc is formed. As the carbons burn away, causing greater separation than at first, the resistance becomes stronger in the conductor around the main coils, and the instant it is greater than in the shunt coils a portion of the current will take that path through the shunt around the arc. The shunt coils produce an opposite effect upon the poles of the magnet, under which is the armature A. The result is less magnetism in the poles, and the armature will recede slightly, easing up on the clutch and allowing the carbon rod to feed. The carbons now being in the original position, the current again flows around the main coils as at first. The armature A is so susceptible to the changes of magnetism that a fine feed is maintained free from sudden commotion, and this is one of the important features of the Waterhouse system, which assists not a little in the production of a steady arc light. Adjustment is made by the screw S strengthening or weakening the spring S′, so as to maintain a constant fine feed, which is an adjustment easy to make.

The lamp is provided with an automatic cut-out, and much attention has been paid to insulating the various parts and adapting the same to the convenience of the trimmer. The Waterhouse Electric and Mfg. Company, of Hartford, Conn., are the makers.

High Pressures in Marine Engines.

In the first of a series of articles on "The Development of the Marine Engine in the British Navy," the London *Engineer* gives the following interesting account of the increase of steam pressures and of the changes of types of engines which are intimately connected with that subject:

In the first steamships that were used in the navy—small vessels that were purchased complete—the steam pressure was about 4 pounds per square inch. The first of these came into the service rather more than 50 years ago, and represented the usual practice up to about the year 1843, the type of boiler being the flue variety. At about this date the flue boiler began to be superseded by the tubular, and the working steam pressure rose between the latter date and 1850 to about 10 pounds to 12 pounds per square inch, 12 pounds representing very accurately the practice about the year 1850. Between 1850 and 1860 the pressure rose to about 20 pounds per square inch. Up to this date the condenser in use was the old jet condenser, in which the condensation of the steam was effected by actual contact with a spray of sea water, the condensed steam became mixed with the salt water, and the mixture, which was but little fresher than sea water, was used for feeding the boilers. About this time was introduced the surface condenser, which, by separating the condensed steam from the condensing water, enabled the boilers to be supplied with fresh feed-water, and thus, by largely preventing the dangerous incrustation on the heating surfaces of the boilers, which resulted from lime and other scale when fed with sea water, enabled the pressures to be still further increased without increased danger due to liability of overheating of plates. This change of type of condenser, therefore, is very intimately connected with the increase in steam pressures, for most of the beneficial results which have followed that increase would have been impossible had not some such contrivance been introduced for keeping the deposit out of the boilers.

Like many other improvements, its general application in practice was delayed for many years after its invention. It was applied in a very similar form to that now used in modern engines as long ago as 1832, but became a usual adjunct of the marine engine only about the year 1860. With the old jet condenser a pressure of at the most 25 pounds per square inch was considered the highest it was prudent to carry in marine boilers, owing to the liability to overheating, and consequently danger of failure of the heating surfaces, due to the accumulation of scale from the salt water feed used. The adoption of the surface condenser almost entirely removed this difficulty. The loss of fuel with the jet condenser, through the necessary practice of blowing out the boilers in order to keep the density within limits, was also avoided by the surface condenser. At least 15 per cent. was the estimated saving of fuel by its use as given by the superintending engineers of the principal steamship owning companies at the time of adoption. Between 1860 and 1870 a large number of engines with surface condensers were fitted in vessels of the Royal Navy, the steam pressure being immediately increased, and was during this period usually about 30 pounds per square inch.

The engines of all the jet condensing vessels were of the simple expansion kind, the steam of low pressure being taken into the cylinder from the boiler, carried late in the stroke, and exhausted direct to the jet condenser. Only a very small amount of expansion was carried out, and with the low pressures then in use the gain to be derived from the expansion of the steam was necessarily of small amount, so that the consumption of fuel for a given power in engines of this kind was very high. During, however, the period above mentioned as that immediately following the introduction of the surface condenser, with the higher steam pressure of 30 pounds per square inch, the principle of expansion was adopted to a much greater extent, and the cylinders were made much larger, so as to allow of a considerable amount of expansion at full power, and considerable benefit was thus experienced in economy of fuel. To the engines of the period of which we are now speaking steam-jacketed cylinders were fitted, and although the gain to be derived from the use of a steam jacket was at that time a subject of great controversy, there is now no doubt that it was a very valuable adjunct, especially to the expansive engine then being made. Of similar use were the superheaters that were fitted to the boilers in connection with these engines. They consisted of an amount of heating surface in contact with the hot escaping gases of the boiler through which the steam passed on its way to the cylinder, and served the double purpose of utilizing some of the heat of the gases and also of increasing the efficiency of the steam. The steam jacket is still in existence in most modern engines, but the superheaters are now obsolete.

There can be no doubt that these expansive engines, with steam of only 30 pounds pressure per square inch, with steam jackets, superheaters and surface condensers were fairly economical, and were a great step in advance from those immediately preceding them.

The introduction of the surface condenser having proved a practical success, and there being now nothing to prevent higher pressures than the 30 pounds per square inch then in use being employed, attention was at once directed to the subject of higher pressure and the more complete utilization of the property of expansion in increasing the efficiency of the engines, a direction which theoretical considerations marked out as being a most prolific one. The result was that the steam pressure went at one step from 30 to 60 pounds, the type of boiler being changed to the cylindrical variety to carry this increased steam pressure safely, and the engine was completely changed to the compound type, in which the steam is first passed into a small cylinder, and at the end of the stroke in that cylinder is passed into one or more additional larger cylinders, and does there a further amount of work, and completes its expansion before being finally exhausted into the condenser. Perhaps no point caused more difference of opinion among engineers than the advantage or otherwise of the compound system. Its first application, indeed, was not a success, but this was made under unfavorable circumstances which were subsequently removed, and since then the system has been remarkably successful, and has caused a considerable impetus to be given to navigation.

In the compound engines the steam-jacket of the earlier types was retained as beneficial, but the superheaters were abandoned. The principal reason for each of the successive steps in the increase of steam pressure which has from time to time been made has always been the gain in economy which resulted, and the amount of this gain in economy by the compound engines using steam of 60 pounds steam pressure over the best previous type of simple surface-condensing engines with 30 pounds of steam pressure, by the adoption of this principle, was about 30 to 35 per cent. This gain is now well authenticated, and the amount mentioned above is the average of the replies given to questions of the Admiralty Committee on Designs of Ships of War, which sat in 1872, by the principal engineers and steamship owning companies.

Since about 1872, and up till very recently, the new engines of the Royal Navy have all been compound. The first of them, as mentioned above, had steam pressures of 60 pounds per square inch. This was increased in a few cases to 70 pounds and 75 pounds after a short time, and about the year 1880 to 90 pounds, the ratios of cylinder areas and the expansion allowed being increased with the steam pressure, so as to more fully benefit by expansion. From this date the rise of pressure has been rapid up to 120 pounds. Very recently, as is well known, attention has again been directed to the engine; and the compound engine being seen to possess defects at these higher pressures similar to those of the simple engines, it has been abandoned in favor of the triple-expansion engine, in which the steam is passed consecutively through three cylinders before being finally exhausted to the condenser. The success of this type, too, has been very striking, and for new engines it has completely displaced the compound type. Since 1885, with a few minor exceptions, all new engines of the Navy have been on the triple-expansion principle, and with boiler steam pressures of at first 130 pounds per square inch, gradually increasing to 155 pounds per square inch in 1887. A further gain in economy has thus been effected, which is variously estimated. From 15 to 20 per cent. over the compound engine of the same pressure is often given as the amount of gain, and probably 15 per cent. may safely be taken as not too much.

An important development, which may appropriately be mentioned at this point, is the adoption of the double-distillation condenser for obtaining fresh water from sea water. This appliance is the sequel to the surface condenser and an extension of the same principle. As mentioned previously, the surface condenser converted the main body of boiler feed water from salt to fresh water; but it is found that a certain percentage of the water taken from the boiler in the shape of steam is lost during its transit back again to the boiler. In the vast majority of ships this deficit of feed water has to be made up by sea water; the scale from which, at the high temperature of the boiler, is deposited and left in it. A double-distillation condenser of sufficient size will obviate the necessity for this, a quantity of addidional fresh water being produced by it without any deposit in the main boilers. It is not possible, however, to fit a condenser which will supply the waste of main engines at high powers, but only for ordinary cruising powers. With the modern marine boiler, however, which has of necessity its internal parts rather cramped for room on account of the limitation of weight, and especially in vessels without an auxiliary boiler, it is found to be really quite inadmissible to distill water for drinking and general ship's purposes direct from the main boilers, on account of the scale necessarily deposited inside, the difficulty of constantly cleaning them and the danger of overheating if not properly cleaned. This objection has caused the adoption of the particular form of distiller mentioned, in which the evaporation takes place in an intermediate vessel between the boiler and fresh-water condenser, and in this intermediate evaporator the scale is deposited, and the arrangements are such that it can be properly cleaned out and dealt with. The generation of steam in the evaporator is caused by the condensation of steam from the main boilers in or around tubes, and this condensed steam is returned to the boilers.

Ford & Moncur Stoves in Great Britain.

From data submitted by Leon & Blair, Pittsburgh agents in this country of the Ford & Moncur hot-blast stoves, they are meeting with much favor in Great Britain, the following list being published of stoves built and in course of construction in that country in May of this year:

Barrow Hematite Steel Works, Barrow-in-Furness.—Seven stoves built and working, viz.: One stove 20-foot diameter by 70 feet high; six stoves 26 feet diameter by 70 feet high.

North Lonsdale Iron Company.—Three stoves built and working, 26 feet diameter by 72 feet high, blowing two furnaces 80 feet high, with 20-foot bosh.

Darwen Iron Company's Works, Darwen, Lancashire.—Three stoves 21 feet diameter by 65 feet high, blowing two furnaces making ferromanganese, 20-foot bosh by 65 feet high each.

Mostyn Iron Works, belonging to Darwen Iron Company.—Three stoves 22 feet diameter by 65 feet high, in course of erection, intended to blow two furnaces making spiegel, 19-foot bosh by 68 feet high each.

Springvale Furnaces, Wolverhampton.—Five stoves, 25 x 65, blowing four furnaces—two 19 x 75 feet and two 18 x 65 feet.

Distington Iron Works, Cumberland.—Two stoves 24 x 60 feet high, two Wardle & Sister stoves altered to Ford & Moncur's patent, adding thereby 90 per cent. to the heating surface, these stoves blowing two large furnaces 70 feet high, making hematite iron.

Chas. Connell & Co., Derwent Works, Workington.—Two stoves 25 x 72, capable of blowing two furnaces; also an additional stove about to be put down at these works.

Maryport Hematite Iron Works, Cumberland.—One stove 26 x 60 and two Cowper stoves altered to Ford & Moncur's patent, 22 x 60 high.

Cleator Moore Iron Works, Cumberland.—Three stoves in course of construction, to blow two large furnaces 75 x 22 foot boshes; stove dimensions, 26 x 72 feet high.

Coltness Iron Works, Lanarkshire, Scotland.—Two stoves 26 x 72, blowing three furnaces making hematite.

Dalmellington Iron Works, Ayrshire, Scotland.—Two stoves 22 x 60 feet built, and two stoves 26 x 72 feet high in course of erection.

Carron Iron Works, Falkirk, Scotland.—One Cowper stove altered to Ford & Moncur's patent.

Harrington Iron Works, Cumberland.—Seven Cowper stoves fitted with Ford & Moncur's system of cleaning by means of compartments fitted with valves and blast pressure.

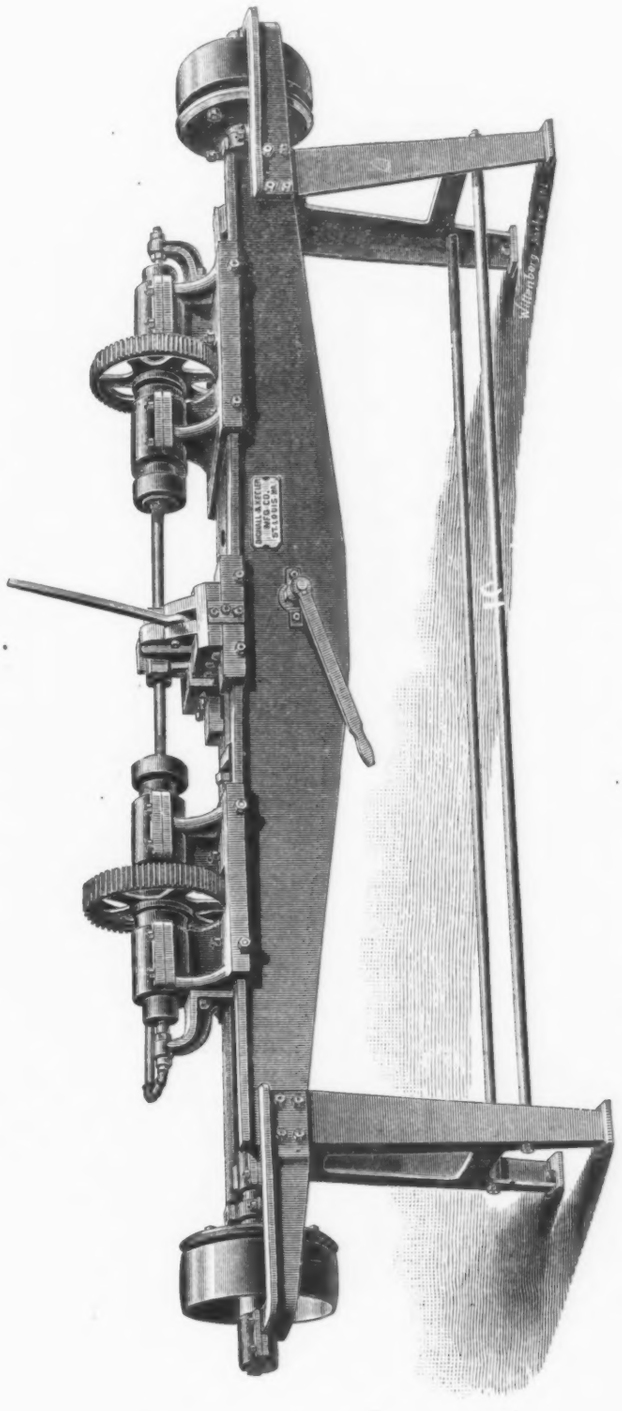
As to the efficiency of the stoves J. Hamilton, of the Coltness Iron Works, Newmains, Lanarkshire, reports to S. A. Fuller, of the Union Rolling Mill Company, Cleveland, that they are blowing three of their furnaces with two stoves, and that they "can easily register up to 1600° F. when wanted." Other letters from A. W. Hickman, of the Springvale Furnaces, near Wolverhampton; from A. E. Lamb, of the Whitehaven Hematite Iron and Steel Company, Limited, of Cleator Moor, and W. McCowan, of the Distington Hematite Iron Works, near Whitehaven, are similarly favorable in their tenor.

Upon one occasion at the works of the Darwen Iron Company, when they had only two stoves heating the blast for two furnaces, each 20-foot bosh by 65 feet high, an accident occurred which obliged them to lay off one of the stoves, and the other stove was blown for eight hours, and kept the furnaces running until the first could be repaired and heated ready for blast again. The first of these stoves to be erected in this country are now being built by an English company, known as the Talladega Iron and Steel Company, at Talladega, Ala.

An Advance in Coke.—The large coke operators of the Connellsville region, whose headquarters are at Pittsburgh, after holding several consultations regarding the condition of trade, have decided to advance the price of coke. On Thursday, the 25th inst., notices were mailed to the trade by the H. C. Frick Coke Company, the J. M. Schoonmaker Coke Company, the McClure Coke Company, the Connellsville Coke and Iron Company, and J. W. Moore & Co., that on and after November 1, 1888, the price for furnace coke will be $1.25 per ton; coke for dealers, $1.35 per ton; and foundry coke, $1.50 per ton. This is an advance of 25 cents per ton over previous prices. No coke syndicate has been formed, the operators merely pledging themselves to make no new contracts at less than the rate agreed upon. The advance, of course, will not affect existing contracts. At the present time, the coke trade is in a better condition than at any time during the year. The blast furnaces are nearly all in active operation, which causes a corresponding heavy demand for coke. It is believed that the advance will not be objected to in any way by the coke consumers, as the price of pig iron at this time is nearly as high as at this time last year, when coke was selling at $2 per ton. Freight rates and the prices of ore are also lower. It seems to be the impression that this advance will be followed by another about the first of the new year. The coke workers of the region have been notified that their wages will be advanced 5 per cent., to take effect on November 1, the date on which the advance in the price of coke goes into effect.

Radiator Tube Threading Machine.

A new automatic machine for threading radiator tubes has just been brought out by the Bignall & Keeler Mfg. Company, of St. Louis, Mo. The engraving on this page explains the character of the design. The machine has the advantage of threading both ends at once, cutting right and left-hand threads. The tubes are first cut off in another machine to exact lengths and then threaded, the machine will thread tubes from 12 to 48 inches in length inclusive. It is automatic in its operation and can be run for hours without stopping. It has an automatic oiling device which keeps the dies constantly flooded with oil. The double head or single machine it is claimed will easily thread 600 tubes a day of 10 hours. The Kansas City Radiator and Iron Foundry Company are threading 70 tubes per hour, and running 12 hours per day at that. A triple chuck machine can be made which will thread about 2000 tubes per day.



AUTOMATIC RADIATOR TUBE THREADING MACHINE, BUILT BY THE BIGNALL & KEELER MFG. COMPANY, ST. LOUIS, MO.

Franklin Institute Lectures.—Among those who will lecture before the Franklin Institute, in Philadelphia, during the coming season are: Prof. Louis M. Haupt, on "The Feasibility of Underground Railroads in Philadelphia," on November 5; John Birkinbine, on "Pig Iron," on November 26; W. M. Barr, on "Interchangeable Work," on January 14; R. W. Hunt, on "The Manufacture of Steel Rails," on January 21; Dr. C. B. Dudley, on "Bearing Metal Alloys," on February 4, and Andrew Carnegie, on "Industries of Pennsylvania," on March 18.

In the course of a speech Mr. J. G. Butler, Jr., of the Brier Hill Coal and Iron Company, gave the following interesting figures relating to the Mahoning Valley iron interests: "The paid-up capital and surplus employed in the Mahoning Valley is $4,583,300, an average of $270,000 for each manufacturing plant. For the year ending June 30, 1888, the value of the product was $13,607,794.70. This immense output required the services of 5048 men. There were paid out for wages $3,016,245.36, or more than $600 per annum income for each person, which includes boys and very many common laborers of small earning capacity."

Treasury Decisions.

Wire mattresses, notwithstanding the fact that they accompany bedsteads, do not come within the scope of the provision in Schedule D (T. I., 230) for "house furniture," but are dutiable at the rate of 45 per cent. ad valorem, under the provision in Schedule C (T. I., 216): *Provided, however*, That such rate is equal to or greater than the rate fixed by paragraph 182 for iron wire of the size of which the mattresses are manufactured.

Short pieces of brass curb chain, although they may be intended to be completed for use as watch-chains, cannot, in their present condition, be regarded as watch-chains, and, accordingly, are held to be dutiable at the rate of 45 per cent. ad valorem as unenumerated manufactures of metal, under the provisions of Schedule C (T. I., 216).

Razors with blades of regular patterns, and with finished handles, are held to be dutiable at the rate of 50 per cent. ad valorem, under the special provision in Schedule C (T. I., 207) for "razors," notwithstanding the fact that the blades are not ground and polished.

Silver-plated hooks, bars and swivels, intended for use in the manufacture of watch-chains, but which may be used for various other purposes, cannot be considered as coming within the scope of the provision in Schedule N (T. I., 459) for "jewelry of all kinds," but are held to be dutiable at the rate of 35 per cent. ad valorem, under the provision in Schedule C (T. I., 210) for "plated * * * articles."

Tin Nails.—We were recently shown a number of nails made from tin plate and sheet-brass scrap by a machine built by the Ferracute Machine Company, of Bridgeton, N. J., and which, at present, is being further improved upon. The nails are punched up from suitably cut blanks, and can be used for all purposes to which the ordinary forms of nails are adapted. They drive well in hard wood, and in point of cost will, no doubt, offer additional inducements. Both the nails and the machine by which they are made are of great interest, and we shall have occasion to again refer to them more at length. Mr. Oberlin Smith, the president of the Ferracute Company, is giving his personal attention to the work of perfecting the machinery.

The through rates from Baltimore to St. Paul and Minneapolis over the C., B. & Q. are: First-class, $1.02; second, 91 cents; third, 74; fourth, 48; fifth, 41; sixth, 33; iron less than carloads, 38 cents; in carloads, 30 cents. These have been made the maximum rates, and will apply to all intermediate points, except when the through rate is less local rates will be charged.

Announcement is made that the Mann Boudoir and Woodruff Sleeping Car Companies have consolidated under the title of the Union Palace Car Company, with a capital stock of $3,000,000.

THE WEEK.

The manufacture of cotton in the South gains in importance from year to year. The Southern Atlantic States, with a production of about 1,750,000 bales, consumed last season 343,042, or one-fifth their production, in their own mills. This is certainly a good showing for an industry originating almost wholly since the war. It is gradually extending from that section to the Southwest, where the bulk of the crop is now produced.

The National Board of Steam Navigation elected officers for the ensuing year, as follows: President, A. C. Cheney, New York City; first vice-president, B. D. Wood, New Orleans; second vice-president, F. A. Churchman, Philadelphia; treasurer, Addison Lysle, Pittsburgh, Pa.; secretary, J. W. Bryant, New Orleans; assistant secretary, Charles H. Boyer, New York City; executive committee, James S. Negley and W. W. O'Neil, of Pittsburgh, Pa.; J. B. Coyle, of Portland, Me.; J. W. Miller, of Providence, R. I; D. M. Munger, F. W. Vosburgh, H. F. Dimock, H. A. Bourne, I. L. Fisher, C. W. Woolsey and M. E. Staples, of New York City; G. W. Pride, Sr., of Philadelphia; A. M. Halliday, of Cincinnati; H. C. Hoarstick, of St. Louis, and C. P. Truslow, of New Orleans. A resolution was adopted that the next annual meeting be held at Pittsburgh, Pa., on the first Tuesday in October, 1889.

The sundry civil bill provides for the expenditure of only $4,000,000 on the new Congressional library building, and the chief of engineers in charge says the limit fixed by law will be adhered to, as the structure will cover less space than was originally intended.

The Brotherhood of Railroad Brakemen has a membership of 14,000.

The Manchester *Examiner* says that although £3,000,000 was the authorized capital for the combination of British salt mining interests, about twelve times that amount was subscribed before the subscription lists closed.

Thomas Axworthy, the trusted treasurer of the city of Cleveland, is one more added to the list of defaulters. The deficit is not far from $500,000, and an amount equal to this sum he is believed to have lost in the "Old Hutch" wheat deal. It is also reported that he lost heavily in the Gogebic iron mining venture, and he was caught in the same wheat corner in Chicago that brought Harper to grief.

Two barks in Philadelphia are loading with locomotives for lines of railway in Brazil and the Argentine Republic, all of which were built by English capitalists, but are equipped with American engines. The first-class cars for the same railways are manufactured in Wilmington, Del.

William H. Walbaum, senior member of the firm of Walbaum & Co., iron brokers in Philadelphia, was killed by falling from the cars on the Pennsylvania Railroad near Menlo Park. He was born in England, and was about 38 years old.

The heavy losses recently sustained by builders in New York, as the consequence of an overloaded market, have led to the adoption of a new device for mutual protection. The builders have commenced forming companies, composed of the builders themselves and their mortgage holders, for the purpose of carrying the imperiled property and preventing its sacrifice by foreclosure or forced sale. So far as this scheme has been tried it works well. It is essentially a scheme for co-operation, and it is consistent with methods that seem to be growing in favor with business men in all departments of the market. It is not precisely a trust, since only the persons compromised in the transactions of a single building firm are made partners in the combination; but it will serve some of the ends of a trust if it can remove the danger of immediate foreclosure, and help to tide over the time while builders are waiting for the return of a normal market.

The late John Wentworth, of Chicago, left real estate valued at $1,125,000; also $375,000 in personal property.

A legal contest has arisen among the heirs of the late John Roach, iron steamship builder, respecting the distribution of property under the will. The plaintiff alleges that William Henry Roach, having been especially trained and educated for the purpose, was in 1864 taken into partnership by his father, the firm becoming John Roach & Son. Upon William Henry's accession to the firm the business began to prosper, and at the time of his death in 1872 it was worth $1,500,000. This growth was due, it is alleged, to the efforts of William Henry Roach. When William Henry died his father continued the business under the same firm name, but made no accounting to the widow of William Henry of her husband's share in the business. The petition sets forth that the deceased husband was entitled to one-half interest in the property remaining.

A German syndicate, in which strong banking interests are represented, are said to have obtained from the Venezuelan Government a concession for a railway from Caracas to the sugar and coffee plantations in the interior. Like the scheme for the encouragement of French colonization, the ultimate object, we surmise, is to check English encroachments on disputed territory.

Captain J. W. Miller, manager of the Stonington Steamboat Company, read a paper before the National Board of Steam Navigation on the Nicaragua Canal as a means of extending and developing the coasting trade of the United States. The carrying capacity of every ship that now goes around Cape Horn will be doubled by the canal, as she will make two trips through the canal to one around the cape. Our coasting vessels, which now stop at the line of Texas on the East and Lower California on the West, will then trade from Maine to Alaska. The region covered by the local shipping interests of the United States is already greater than that controlled by any foreign nation, but the separation of our Eastern and Western coasts has tended to develop railway transportation, while the ocean-carrying trade has been gradually engrossed by foreign ships. The Nicaragua Canal will give us control of traffic over a coast line of 8000 miles, in which there can be no foreign competition.

An excursion to Mexico is proposed by the New Orleans Chamber of Commerce, in hopes of causing a diversion of trade from the European steamship lines terminating at Vera Cruz, but Mexican journalists do not speak hopefully of the scheme.

The records of the transactions of Congress during the session just closed show that the whole number of bills and joint resolutions passed was 1443, of which 1197 were approved by the president; 95 became laws without signature, 128 were vetoed and 23 failed for want of signatures at the time of adjournment. The enactments of a commercial nature comprised a bill for an international marine conference to promote safety at sea; a bill providing for a congress of representatives of American nations to discuss plans for commercial union, trade relations, &c.; bills to define the permissible marks on mail matter; establishing a Department of Labor; to carry out the treaty for protection of submarine cables; compel the maintenance of Pacific railroad telegraph lines; to define the meaning of obscure provisions of our tonnage laws, and abolishing fees for the official inspection of steam vessels.

The will of the late Samuel J. Tilden, providing for the establishment of a public library, is sustained by Judge Lawrence, of the Supreme Court. The amount involved is said to be about $10,000,000. An appeal will be taken.

The Coroner's jury in the case of the "Mud Run horror," on the Lehigh Valley Railroad, find the engineers and conductors alike guilty in failing to observe the usual precautions against a collision of trains.

Members of the New York Produce Exchange are endeavoring to carry into execution a plan for circulating the daily market quotations throughout the country. The plan, in brief, is to establish telegraphic connections with Chicago, Toledo, Detroit, Buffalo, Toronto, Cincinnati, Montreal, St. Paul, Minneapolis and Duluth upon a basis of a division of expenses with each of the above-named markets. Estimates are being secured, and it is thought that an annual expenditure in the aggregate of $50,000 will accomplish the desired result. Of this amount, $25,000 would fall to the share of the New York Exchange.

The complaint that the insulation of the electric wires placed in the subways has in some instances been destroyed by the escape of steam from the Steam Heating Company's pipes appears to have been well founded, but the engineers employed profess to believe that this difficulty can be remedied. A manufacturer of cables claims that cables can be made which will stand a test of 200° heat.

"Training for Trades" was the subject of a lecture delivered last week by John J. Tucker, of the Aqueduct Commission. He pointed out the manner in which young men had been drifting into clerkships and deserting the mechanical trades. Two reasons were assigned for this—the idea that a mechanical trade lowers the social standard and the abandonment of the apprentice system. The remedy he suggested was the establishment of technical or trades schools in connection with the city educational institutions. Such schools would elevate the mechanical trades. All the trades could be taught in one school, and a trade could be learned in one-third the time it now takes.

The Atlantic and Union dredging companies, of Brooklyn, and contractor Thomas Potter, of Jersey City, have formed a partnership to build a storage basin in New York Bay, at Bayonne.

The newspaper press of Mexico, like that of the Argentine Republic, is fruitful in schemes designed to attract immigration, but the general disposition is to invite Europeans rather than North Americans, respecting whom it is said there is "in some journals a marked dread of a possible preponderance of American influence."

Admiral D. D. Porter has made his annual report to the Secretary of the Navy. He says he regards sailing vessels as the best practice ships afloat, and that, while a couple of steamers might well be employed as gunnery ships, the Portsmouth, Jamestown and Saratoga should be retained in the navy for the purpose of giving the apprentice boys an extended voyage to sea. On the subject of torpedoes the Admiral says that for years he has doubted the efficiency of the Whitehead and other fish torpedoes, and he adds: "The torpedo, no doubt, can be made a powerful adjunct to other naval appliances, but, as matters now stand, the Mobile torpedo

would be comparatively useless against heavily armored ships with power guns, which would hold their own, notwithstanding they might be hampered with nets enough to keep out a whale torpedo. Ships might have to pause for a while before torpedoes planted on the bottom, but the stoppage would only be temporary, enabling the inhabitants of seaboard cities to move inland with their portable effects. Great ships with great guns will command the situation, and, having once effected an entrance into the harbor, can, by aid of the electric lights, send a party of divers to the bottom and cut the wires connecting submerged mines. These are at present the only torpedoes to be feared as very dangerous, and these become less formidable after having remained for some time under water. Our country more than any other stands in need of torpedo vessels of from 1600 to 2600 tons displacement until we can get our new navy fairly started. This class of vessels could be built much more rapidly than the cruiser or armorclad, their batteries to be not larger than 6 inch rifles and fitted with machine and rapid-firing guns. Hulls on the plan of the Polyphemus would be good ones with which to begin."

An industrial school for the training of boys is proposed by I. V. Williamson, a wealthy citizen of Philadelphia, which will rank in extent and educational importance with the great charity founded by Stephen Girard. Mr. Williamson has named a board of trustees to which will be intrusted the consummation of his plans, and is now engaged in the task of adjusting his securities so that his endowment will be of a permanent character. It is expected that the announcement of the intended gift will be made before the end of the year.

Augusta, Ga., is among the most prosperous of Southern cities. Trade has grown to a volume of $63,000,000, an increase of $9,000,000 in the past year. New river steamers have lowered rates to the coast one-third on cotton and produce, placing the city in a great measure independent of railroad consolidations. The building improvements the past year have reached $1,500,000, and the tax digest for 1888 shows a total of $20,000,000, an increase of $4,000,000. The Augusta National Exposition opens November 8.

A corporation called the Massachusetts Dredging Company has been formed by New York and Boston capitalists for the purpose of dredging the Charles River and reclaiming the adjacent Cambridge marshes. The machine to be used was invented by a Russian named Alexcy von Schmidt, who now lives in California. It not only dredges the channel of the river or harbor, but deposits the material on the shore by hydraulic pressure through iron pipes laid overland or across pontons, and thus may be made to reclaim land a mile away.

The city of Chicago, otherwise known as the Lake City, if its population continues to increase as at present, will soon contain as many people as all the rest of the State. Including its suburbs, Chicago now represents one-fourth the population of Illinois, and, it is estimated, will cast 180,000 votes at the coming election, as compared with 570,000 in the rural counties.

Clausen's brewing establishment in this city was sold to an English syndicate for $4,500,000.

The Governor of Utah reports an increase of only about 60,000 souls in that Territory since 1880. The manufacturing industries of the Territory are said to be in a satisfactory condition, and, taken as a whole, the year has been a prosperous one. The aggregate mineral product of the Territory for the calendar year 1887 is given as $7,637,729, of which $5,976,884 was silver.

It is said that the total cost of the improvements making this year on the Pennsylvania Railroad will be near $2,000,000, a large part of the expenditure being for third and fourth tracks and steel rails.

A grand scheme to promote immigration from Europe to the Southern States is being promoted by agents of the principal lines of Southern railroads, who held a meeting in Louisville a few days ago, with this object. It is proposed that the West India and Pacific Steamship Line, running from Liverpool, shall, like the big lines to New York, carry emigrants, landing them in New Orleans, to be distributed by the several railroad companies to whatever part of the South, West or Pacific slope they may desire to go. The expectation is that a considerable share of the trade may be diverted from Castle Garden.

The keel of the naval vessel Maine was laid unostentatiously at the Brooklyn Navy Yard on Thursday. She will be the largest and most powerful vessel yet undertaken for our navy. She will have a length between perpendiculars of 310 feet, an extreme breadth of 57 and a mean draft of 21½, with a displacement of 6648 tons. Her engines will have an aggregate of 8750 horse-power, which should give her a speed of 17 knots. Her armor belt will be 11 inches thick and her turret and breastwork only ½ inch less. Her main battery will consist of four 10-inch and six 6-inch breech-loading guns, the former being in turrets; and, as these are placed *en échelon*, the whole four can be fixed directly ahead or directly astern.

At the Texas State Fair may be seen one of the spades used by the Pueblo Indians in cutting the irrigation ditches at Ysleta, Tex., in 1540.

"Uncle" Rufus Hatch expressed himself on 'Change in reference to the big wheat deal and the manner in which foreigners engage in transactions of this character. While in Chicago last week he said: "Seven-eighths of the loss was by foreigners, through their New York correspondents. The foreigners have been domineering our wheat market for three or four years, and I am glad to see them get the worst of it. The speculation in Berlin, Vienna nnd Liverpool has been immense. The regular importers of wheat have been gambling in American markets and making enough to pay the freight on their importations. The method was to buy cargoes of wheat in Australia or India and then sell for future delivery in Chicago. They would make 2 and 2½ per cent. a month and come out with enough to pay the freight on their cargoes. They were always short and had a notion that the wheat crop in America was illimitable. The Almighty sent a frost a little earlier this season and the foreigners were nipped. They don't understand it, and lots of them are short now. They will find it out in six months."

All measures designed to exterminate those powerful monopolies known as trusts, or at least to counteract their evil effects, are left in abeyance until after the election. Respecting the future one of our commercial contemporaries remarks: "In the quieter and more rational period, which we hope will follow the election, men of both parties in Congress, yielding to the demands of their wronged and indignant constituents, ought to join in finding out constitutional and effective ways of rendering powerless the copper trust, the sugar trust and the rest of the monstrous brood. And in this excellent work may we not count upon the assistance of legislatures in passing stringent laws, if required, to meet the emergency, and also upon prosecuting attorneys to enforce existing laws against those illegal combinations, which are only old offenders now robbing the public under the alias of trusts? There is really no reason why officials of all parties, being safely installed in their seats at Washington or at the State capitals, should not unite in a grand hunt for the extermination of trusts."

The tow-boat business of New York harbor represents an investment of several million dollars. To build a tug costs all the way from $12,000 to $50,000. From figures furnished by the local inspectors of steam vessels, whose duty it is to keep track of tugs as well as of all other steamboats, it would seem that there are now employed in the river and harbor something like 300 tugs. Estimating that the cost of building these tugs is, on an average, $15,000, it will be seen that the money sunk in their construction foots up in round figures the enormous amount of $4,500,000. And that, tow-boatmen say, falls far short of the mark. Fully 80 per cent. of the business is controlled by corporations. Most of the great railroad lines, for instance, do their own towing and own their own tugs.

The great manufacturing city of New ark shows an enrollment of 37,932 on the registry lists, against 32,270 in Jersey City, which is given by the census a larger population.

M. de Tchihatchef, a writer in one of the French newspapers, asserts that the average flow of petroleum in the Baku region is 88,000 barrels per day, as against 25,300 in the United States. The chief drawbacks encountered by those who have worked the Baku oil fields have been lack of transportation, absence of fuel and want of cheap packages. A railroad built across to Batoum, on the Black Sea, opened two maritime routes to Europe and met the first difficulty; cars and vessels constructed to carry crude oil met the last, and enabled the refineries to be built in the interior of the empire wherever fuel might be cheapest. It is confidently predicted, since the completion of the Batoum railroad, that Russian oil will displace American in the European markets, and that it will even be possible for the Russian product to compete for the markets of the United States. M. de Tchihatchef points out a probable demand in the near future for petroleum to serve as fuel on the great lines of railway completed and still building in Asia. He sums up the case, as made up by him, with the words: "It must be admitted that the enormous advantages which Russia possesses over the United States must necessarily lead one day to a complete victory over her present powerful rival."

Work has commenced on a great overflow dam in Paradise Cut, 15 miles south of Stockton, in the San Joaquin River, California. The dam will be 250 feet long and 40 feet high, and will be made of timber, with earth filling. The intention is to keep the strong current of the San Joaquin in the main river channel, thus scouring it out and aiding navigation.

The iron steamship Atlas, built in 1873, at Dumbarton, Scotland, and which had just arrived from Costa Rica with a cargo of coffee, logwood and bananas, was run into last week by the ferry-boat Central, off the foot of Barclay street, in this city, and sunk in five minutes. The ferry-boat penetrated about 10 feet, the iron plates seeming to offer little resistance. The steamer was valued at $100,000 and the cargo about $45,000.

MANUFACTURING.

Iron and Steel.

The nail factory of the Belmont Nail Company, at Wheeling, W. Va., is in full operation, with the exception of the small nail machines, which are idle for an indefinite period. The report that a strike had taken place at this mill is without foundation. The Belmont, like several other nail mills and tack factories in the country, desired to place itself in a position where it could compete in the market on small nails. This cannot be done unless a single feeder runs eight machines, as in tack factories, instead of four, as in nail mills. No reduction in price was demanded. The small machines, at the Belmont are located in an annex, separate and apart from the other machines but under the same roof. A proposition was made to the men who run these small machines that they be run hereafter on the tack factory basis. At first they consented, but afterward reconsidered the matter and declined for the present, when the machines were closed down, and will remain closed until such time as the men can agree that they may be run upon a basis that has been adopted by other mills and which will enable the company to meet a fair business competition.

Fannie Furnace, at West Middlesex, Pa., operated under lease by the Wheeler Furnace Company, of Sharon, Pa., is 60 feet high, 12 feet 2 inches at the bosh, and 8 feet at the tuyeres. The furnace was blown in last May, and has been running along at the rate of 80 to 90 per day, but for the last two weeks has averaged over 100 tons per day. For two days in succession it produced 106 tons. Ore yields 58.4 per cent., while 2031 pounds of coke is used to each ton of iron made. The furnace is equipped with iron stoves and a 72-inch blowing engine, made by Macintosh, Hemphill & Co., of Pittsburgh. There is also another small engine which is seldom used. The furnace is at present running on Bessemer, and since August 17th all the iron produced has been strictly No. 1, with the exception of one cast.

Northampton Furnace, near Freemansburg, Pa., operated by the Bethlehem Iron Company, of Bethlehem, Pa., was blown out on Monday, the 20th ult., and will remain idle until spring. In the meantime the furnace will be thoroughly overhauled and improved.

The Apollo Iron and Steel Company, of Pittsburgh, are operating their plant at Apollo, Pa., to its utmost capacity. The steel department is being operated double-turn, while the galvanizing department, which is the largest in the United States, has not been closed down for any length of time since it was built, over two years ago. Six pots are now in operation.

Moorhead, Brother & Co., of Pittsburgh, proprietors of the Vesuvius Iron and Nail Works, at Sharpsburg, Pa., are using coal gas made by a new process, which enables them to furnish fuel for a ton of iron at a cost of a little over $1 for heating and puddling. A heating furnace in operation for several weeks has shown the cost in the heating process to be less than 60 cents per ton. Two new double puddling furnaces, which are to be furnished with fuel made under the same process, are about ready to be lighted. The new method will effect a saving of almost $4 in making 10,000 pounds of muck bar in a quadruple puddling furnace, and nearly half as much in a double puddling furnace.

The Moorehead-McCleane Company, proprietors of the Soho Iron and Steel Works, at Pittsburgh, have contracted with the Lewis Foundry and Machine Company, Limited, of that city, for the erection of a 16-inch skelp mill, which will enable the firm to make all sizes of skelp iron such as are made in grooves. Heretofore they have made some sizes on plate mills for the Pittsburgh Tube Company, in which the firm are interested. The completion of the new mill will enable them to manufacture all sizes required.

The Mahoning Valley Iron Company, of Youngstown, Ohio, are making a number of improvements which will increase their output considerably. The company are at present rebuilding their blast furnace, and have also built a new engine-house and pattern shop and placed several new boilers in the rolling mill.

Week before last Phœnix Furnace, owned and operated by Brown, Bonnell & Co., of Youngstown, Ohio, produced 804 tons of pig iron, which is the largest production in that length of time in the history of the furnace.

The Iron City Mfg. Company is the name of a new organization that has succeeded to the business of Geo. Y. McMurtry, manufacturer of hot-pressed nuts, at Pittsburgh, Mr. McMurtry having disposed of his entire interest in the business. Robert J. Taggart is secretary and treasurer of the new firm.

From a recent issue of the Franklin (Pa.) *News* we take the following: "An idea of the advantage of having industries in a town may be formed by a glance at the total amounts now paid out each month in New Castle, Pa. Some of the pay sheets are as follows: Johnston's Sheet Mill, $20,000; Etna Iron Works, $20,000; Witherow's Work's, $12,000; New Castle Wire Nail Works, $10,000; Crawford Iron and Steel Company, $6000; Oliver Bros. & Phillips, $5000; Baldwin & Graham's Stove Works, $4800; Etna Furnace, $4000; Raney & Berger Furnace, $4000; New Castle Paper Mill, $1000; total, $86,000."

From a recent issue of the Sharpsville (Pa.) *Times* we take the following information relating to the blast furnaces in the Shenango Valley: "Mabel Furnace has been making a phenomenal output of iron lately, and can lay claim to having the best record of any furnace in the valley. This furnace is making on average 120 tons of Bessemer iron a day, with a maximum daily output of 130, the latter amount having been made last Monday. This for a 65-foot stack will be hard to beat. The Claire Furnace is also making a large amount of iron, her best day's output being 147 tons of Bessemer. This furnace has a record of 896 tons per week. The Sharpsville Furnace, which was blown out some time ago, is undergoing extensive repairs which will largely increase the output of iron when it is again put in blast. The old bosh has been torn out, the salamander taken out and a new bosh is being put in. A new hot blast, of Pierce patent, is being built, and other improvements made which will take some time to complete.

The National Tube Works Company, of McKeesport, Pa., have commenced the erection of a new puddling department, to contain 20 puddling furnaces.

The Lehigh Iron Company, of Allentown, Pa., have recently blown in No. 1 furnace, which has been undergoing repairs

The entire machinery for the new plant of the Roanoke Rolling Mill Company, at Roanoke, Va , has been almost completed by Wharton McKnight, proprietor of the Anchor Foundry, at Pittsburgh. The works have for some time been running full night turn, in order to complete the order in time to allow the new rolling mill at Roanoke to start up on January 1. Four engines, an 18-inch muck train, a 16-inch bar mill, a 10-inch guide mill, squeezers, shears and hot saws, all of which will be run by separate engines, have been already completed.

The Allentown Iron Company, of Allentown, Pa., last week blew in an additional furnace.

In our issue of September 13, last, we made mention of the fact that the plant of the Wheatland Iron Company, at Wheatland, Pa., owned by the Woods heirs, of Pittsburgh, and which has been idle for more than ten years, would resume operations in a short time. Last week a partial resumption of the plant took place, and it is expected that in a short time all departments will be in full operation. Skelp iron of large sizes will be the principal product, of which the plant will have a capacity of about 300 tons every 24 hours.

A report was published in the Pittsburgh papers last week, to the effect that Singer, Nimick & Co., Limited, steel manufacturers, of that city, had decided to make a reduction in wages. We find, upon investigation, that the report is untrue. This firm have refused to recognize either the Amalgamated Association or the Knights of Labor, but the men are employed with the understanding that the firm will always pay as high a rate of wages as any union mill in that city.

The Lloyd-Booth Company, proprietors of the Falcon Foundry and Machine Works, at Youngstown, Ohio, have just completed for the Warren Iron and Steel Company, of Warren, Ohio, a heavy scrap shear to cut up to 5-inch round iron cold. The shear is of a new pattern and modern design.

We are informed that the report that the supply of natural gas had been cut off from the mills of Brown, Bonnell & Co., of Youngstown, Ohio, is without foundation. The entire plant of this firm, with the exception of the nail factory, is being operated to its utmost capacity.

Some months ago McClure & Schuler, engineers and contractors, of Pittsburgh, fitted up No. 1 Furnace of Shoenberger, Speer & Co., of that city, with three Massicks & Crooke's hot-blast stoves. Since these have been in operation they have given entire satisfaction, and a few days ago the firm received a contract for three additional stoves of the same design be be placed in No. 2 Furnace. Work on these will be commenced early during the next month.

Edith Furnace, of the Edith Furnace Company, at Allegheny City, Pa., which has been out of blast since June 16 last for relining and repairs, resumed operations on Wednesday, the 24th ult. This furnace is operated under lease by the National Tube Works Company, of McKeesport, Pa., and its entire product, amounting to about 700 tons per week, is consumed by that firm.

A company is now being formed, and all the stock, $250,000, is already subscribed, for building a 150-ton coke furnace at Toledo, Ohio. It will be a complete modern plant, costing, perhaps, $200,000. Its product will be foundry and forge iron made from Lake Superior ores with Connellsville coke. It is backed by Cincinnati and Southern Ohio and Toledo capitalists. All of the parties actively interested are experienced and successful iron men. It is expected that work of construction will be begun at an early date.

The charcoal iron furnace of the Appleton Furnace Company, at Appleton, Wis., was burned on the 28th ult.

Messrs. Matthew Addy & Co., of Cincinnati, inform the *Bulletin* of the Iron

and Steel Association that Pioneer Furnace, at Thomas, near Birmingham, Ala., of which they are the agents, made during the week ending October 6 787 gross tons of pig iron, 89 per cent. of which was foundry iron. This is an increase of 37 tons over the highest previous weekly make. Since the furnace was put in blast last May it has made less than 1000 tons of forge iron.

Machinery.

The Stearns Mfg. Company, of Erie, Pa., are still adding to their boiler and engine works, which now cover an area of 6 acres. They commenced business in 1887, and have since that time built and equipped: 1. Machine shop, 80 x 300 feet, with floor space of 39,000 feet, provided with a splendid 15-ton crane, which commands the whole length of the building. 2. Smith shop and boiler rooms, 50 x 147 feet, with 7350 feet floor space. 3. Boiler works, 80 x 200 feet, with floor space of 16,000 feet. 4. Foundry, 85 x 200 feet, floor space 17,000 feet. 5. Carpenter shops and storage rooms to balance of territory. The buildings are all especially adapted to their uses, and, altogether, make one of the most valuable and sightly plants in the country. They employ 450 hands, and are taxed to the utmost to meet their orders.

The Hyde Iron Works, of Bath, Me., formerly known as the New England Marine Engine and Machine Works, have resumed operations. Only a few men are employed, but it is probable that a full force will be engaged soon. These works will be run in connection with the Bath Iron Works.

Last week the Westinghouse Electric Company, of Pittsburgh, concluded the establishment of two electric light plants, numbering together 1100 16 candle-power incandescent lights. One of these plants is at Tyler, Tex., with 650 lights, and the other at Clinton, Ill., with the same number.

H. K. Porter & Co., of Pittsburgh, builders of light locomotives, have received an order from the Japanese Government for two Mogul 42-inch gauge locomotives to be used on the Paranai Railroad in the island of Yesso. This line is of the narrow gauge standard adopted by English engineers for India and some of their other colonies. H. K. Porter & Co. are the first locomotive builders in the United States who ever sent an engine to Asia. Formerly English manufacturers had the exclusive trade, although later on some French locomotives were sent there. Their first consignment was in 1880 for two locomotives; the second, May, 1881, for two locomotives also; the third, May, 1884, one locomotive; the fourth, January, 1885, two locomotives. The present order will be completed by February, 1889, and shipped.

The Indiana Machine Works have been incorporated at Fort Wayne, Ind., with a capital stock of $75,000. J. C. Peters and others are the incorporators.

The Grant Locomotive Works, of Paterson, N. J., are considering the subject of moving to some Western point "for business reasons"; but W. W. Grant, when questioned on the subject, was not disposed to speak more specifically about it just now. Minneapolis, as well as Chicago, claims to offer superior advantages as a new location.

The Williams & Orton Mfg. Company, of Sterling, Ill., have opened an office at 152 Lake street, Chicago, for the sale of the Charter gas engines. These engines were awarded the medal of superiority by the American Institute, New York, in 1886. They are suitable for running passenger and freight elevators, printers' machinery, pumps, saws, lathes, sewing machines, fans, coffee and spice mills, and for other service requiring from 2 to 25 horse-power. The company have issued an illustrated circular describing the engine and giving a large number of testimonials respecting its efficiency and economy.

The Hughes Steam Pump Company, of Cleveland, Ohio, report an active business in their line of manufactures. They have recently made extensive additions to their establishment and are now running a largely increased force of men night and day.

Mr. A. Mugford, of Hartford, Conn., who is no doubt well known to many of our readers as a wood engraver and printer, has just issued a new copy of his catalogue, which he calls "The Manufacturers' Exchange," and which contains specimen impressions of wood cuts recently turned out by him for different manufacturers. The engravings are, without exception, well executed and readily commend themselves to manufacturers.

At the Centennial Exposition of the Ohio Valley, in Cincinnati, the Waterhouse Electric and Manufacturing Company, of Hartford, Conn , were awarded a gold medal and two silver medals on their arc light plant exhibited. The company are to be congratulated on receiving their second gold medal, the first having been awarded at the Mechanics' Fair, Boston, in December last.

The Egan Company, of Cincinnati, Ohio, are at present building a large line of special machines for finishing and polishing wood surfaces, notably sand-papering machines, which, we understand, are ingenious and simple in construction. It is of some interest to note here, also, that at the Cincinnati Centennial Exhibition the company received medals of superiority on all the machines which they had entered for competition—namely, their No. 4 planer and smoother, dove-tailer, slot tenoner, wood-worker and molder, combined band and scroll saws, shapers, &c.

The Ball Electric Light Company, of New York, report recent sales amounting to 1095 arc lights.

Hardware.

Articles of incorporation were filed in the recorder's office in Kansas City, Mo., October 8, by the Western Electric Lock Company, with a capital stock of $100,000. The purposes for which the corporation are formed are to manufacture, sell and deal in the Gill electric combination lock in all its various applications in connection with railroads, telegraphs, telephones, military and naval purposes, police and fire departments. The company will also deal in all other electrical contrivances of this character. The incorporators are Benjamin F. Jones, Edward L. Martin and Alfred W. Jones.

From a recent issue of the Reading (Pa.) *Times* we take the following account of the works of the Reading Hardware Company, which were destroyed by fire some time since:

The work of rebuilding the Reading Hardware Works is steadily going ahead, though not so rapidly as it would were the weather more favorable for building operations. Every precaution that time, skill and money have been able to secure in the way of putting up an entirely safe and thoroughly fire-proof structure is being employed. With this in view the enterprising management is availing itself of every valuable architectural improvement known in the construction of large industrial establishments. The isolation of some of the buildings heretofore connected; the absence of joists, which present so much surface for combustion; the introduction of iron doors and shutters; the connecting of the different buildings by means of iron bridges, together with other devices for preventing the spread of fire, are among the improvements contemplated. The present necessarily limited capacity of the works is taxed to the utmost in the production of goods for the trade. In addition to this the Manhattan Works leased by them, and employing some 300 hands, is turning out work as fast as possible. Large heaps of burnt castings, running into tons, are still on the premises as terrible reminders of the severity of the conflagration which laid in ashes one of the largest and most prosperous industrial establishments in the country. With favorable weather the works will soon be rebuilt. When that shall have been accomplished, and with the introduction of the latest improved machinery to equip the factory to meet all its varied needs, we may confidently look upon the new Reading Hardware Works as an institution in which every citizen will feel a just pride.

The American Wire Nail Company, Covington, Ky., will break ground at once for an extensive wire nail manufacturing plant, including a rod and wire mill, at Anderson, Ind. The new works will be situated within easy access to four lines of railroad, the C. C. C. and I., C. W. and M., Pittsburgh, C. and St. L. and the Midland. The site consists of 10 acres of land, upon which will be erected six large structures, consisting of wire mill, 85 x 285 feet, with which is connected a nail mill, 100 x 200 feet; rod mill, 100 x 260 feet; boiler house, 40 x 80 feet; machine shop, 50 x 100 feet, and carpenter shop, 50 x 100 feet. The machinery for the rod mill will be built by the Lewis Foundry and Machine Company, Pittsburgh, having a capacity of 100 tons per day. The wire machinery is to be built by M. Darragh, Fallston, Pa., having a capacity of 75 tons daily. Motive-power will be furnished by a 2000 horse-power poppet valve engine, made by H. Frisbie & Co., Cincinnati, the cylinder of which measures 48 x 60 inches, with band wheels, having each a 38-inch face and 22 feet in diameter, the combined weight of which will be 50 tons. The wire and rod mill building will be advanced as rapidly as possible, while work on the nail mill will be commenced early in the spring. The latter is to have a complement of 50 machines, which number will be added to as necessity requires. The entire plant will be completed about March 1, 1889, when 300 men will be given employment. The entire works will be illuminated with electric light. Fuel being one of the larger items entering into the cost of manufacturing wire nails, has urged the selection of Anderson for the location of the new plant. A natural gas well with 325 pounds pressure is now flowing on the property, which was donated to them by the city in addition to a generous bonus, while the new location is more centrally located to their trade in the North, West and Northwest, which territory is to be supplied from that point. The works at Covington will continue in operation to supply the local and Southern trade principally. The capital of the company has been largely increased by the admission of Messrs. Garvey Bros., of Covington, Ky. This will involve no change in the active management of the business affairs of the concern, Mr. L. H. Gedge occupying the position of president; Mr. E. J. Buffington, treasurer, and B. H. Gedge, vice-president and secretary.

The Whitney Gun Company, of Northampton, Mass., have most of their tools made and are now engaged on several guns that will be used as samples, and after their introduction the general manufacture of the arms will be begun.

At a meeting of the stockholders of the Bryden Horse Shoe Company, Limited, of Catasauqua, Pa., held in that place on Thursday, the 25th ult., it was decided to increase the stock of the corporation. It is intended to erect new works and enlarge the plant considerably. The new works will be in operation about the 1st of December next.

The Iron Age

New York, Thursday, November 1, 1888.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, JR., - EDITOR.
GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO
RICHARD R. WILLIAMS, - - HARDWARE EDITOR.
JOHN S. KING, - - - - BUSINESS MANAGER.

The growing importance of the interests of *The Iron Age* in St. Louis and in the flourishing territory tributary to it has led us to open a branch office in the Commercial Building, 212 North Sixth street, St. Louis. Mr. H. H. Roberts, who has assumed charge, is long and favorably known to many of the friends of *The Iron Age* in the East, through his connection with the Philadelphia office. He thus brings to his new field a correct appreciation of the requirements of our patrons, so that it remains for him to overcome only the difficulties incident to a change of locality. We bespeak for him the confidence he deserves and the support he will strive to merit.

Competition and Protection.

Competition is not the simple matter that some "students of maxims instead of markets" seem to imagine. As we infer from their utterances, they conceive that two or more manufacturers (the more the better) compete for a given market. Competition cheapens prices, of course, and improves quality at the same time. As soon as a manufacturer cannot sell at a profit goods of the required quality competition ends. He withdraws from that market, and, if he can command no other, "seeks a more profitable occupation"—in which non-productive, transitory state of "seeking" these theorists, if they had their will, would keep a large proportion of the capital and labor of the world all the time; for it is to them as plain as A B C that the process forces everybody into "profitable occupation." But the competition which business men most fear begins just where these amateur economists think it ends, and the situation which they fancy drives the competitor out of the market really makes him, on the contrary, the most dangerous of adversaries in it.

Not to refer at all to actually insolvent concerns, who are merely keeping paper afloat, competition has five stages, in which its objects are respectively, profit, interest on capital, general expenses, repair and guarantee funds, and, finally, primary cost—*i. e.*, the mere cost of the materials of manufacture and the wages of manual labor employed. It is the latter element only which figures in political editorials and stump speeches as "cost," and not infrequently it is subtracted from the market quotation of gross selling price, to ascertain the "profits" of the bloated employer. In the first stage above mentioned, competition cannot kill. Some manufacturers may thrive better than others, but all get along. The result, of course, is that in every line of business, if the conditions are only fairly favorable on the average, a few men or firms can be pointed out who have amassed great fortunes by reason of specially favorable conditions not possessed by their fellows. To attempt to bring down their profits by any measure affecting the whole business would merely kill off their competitors and leave them a monopoly. The firm of Mr. Andrew Carnegie, for instance, possess an advantage in their own natural gas wells, possibly surpassing in amount the total profit of some of their competitors, and the location of their works at Pittsburgh secures to them, besides, an additional protection of several dollars per ton of product against foreign competitors. The ardent politicians who would like to strike Mr. Carnegie through the tariff ought to know that they will have to kill half a dozen great enterprises before they can even worry him. For he is, at all ordinary times, competing in the realm of profits merely.

As competition grows sharper, and in intervals of slack demand and low prices, the fight is for interest on capital. Here the financially weak, who are operating with borrowed capital, may go to the wall. But our great solvent concerns are prepared to forego not only profits, but a part or the whole of the interest on their capital, rather than abandon the field, or even suffer the injury and loss of prestige due to a temporary stoppage. It is in the next stage, however, that, as prices fall still lower, the real life-and-death battle begins. The general expenses are items which must be paid, as truly as the wages of the immediate producers; but the difference is, that the former would go on in nearly the same ratio, even if the manufacture were temporarily suspended. It costs so much a month for mines or iron works to stand still; and, unless the suspension is made intentionally for a very long time, this sum cannot be reduced. Rather than incur the evils of stoppage, the manufacturer will therefore endure the loss of part or all of the general expenses. Beyond the constant items of general expense come the provisions for repairs, renewals, bad debts, &c. These, of course, ought to be kept up, but rather than suspend operations they will be omitted from the calculation, and the product will still be made and sold, though it does not bring more than its primary cost.

The last and most desperate struggle of all comes when the market price of the product would not replace the material and labor actually in it. In pig iron this point would be reached when the price obtained for a ton of pig would not buy the ore, coal, and limestone, and pay the actual furnace labor necessary to make another ton. As an economic proposition, no wise manufacturer would feel justified in entering this stage at all. But as a business proposition, every manufacturer of a non-patented article may have to do it sometimes, and many must do it often. They are, of course, impelled by the hope that the necessity will be but temporary, but in many instances it lasts a long time. We have heard of single English houses selling below cost for years, in a particular market, and losing £1,000,000 outright, rather than permanently surrender that market. American manufacturers have often shown the same spirit. If they obeyed the laws of political economy, and shut down their works every time the business was not profitable, their workmen would lead sorry lives. "No orders" does indeed shut many works at times, but orders at low prices are always eagerly taken to keep the works running. The prices paid for a large part of the elevated railroad work in New York and Brooklyn, for instance, could not have covered general expenses and renewal funds, if, indeed, they covered primary cost.

Now, it is in the last two or three stages of the competition we have sketched that manufacturers need protection most, if they need it at all. And the principal objection to the notion of a strictly revenue tariff with "incidental protection" is that such incidental protection operates most when least needed and *vice versa*. For it calls for ad valorem duties, which are lowest when prices are lowest. But no protection is or can be given against home competition. Why should it be given against foreign rivals? Bethlehem, Troy and Scranton are not protected against Carnegie; why should they be guarded from Dowlais?

This is a fair question, to which the complete answer is complex. We wish to emphasize a single branch of it only—namely, the impossibility of foreseeing and providing for desperate foreign competition. The home situation we can watch. We can see the influences at work. So far as they result from Federal legislation, they are common to all American works, or, if injustice is done to any locality or business, appeal can be made to our own Government for a remedy. But we can neither foresee nor control the cause which may suddenly determine a foreign manufacturer to ship his unsaleable surplus stock to this country, and sell it here below cost in order to stiffen the prices of his home market. Perhaps some event in Egypt or India, reacting on the English money market, has affected particular establishments there, the American competitors of which did not dream that Egypt or India would thus indirectly bring a conflict upon them. This is scarcely a fancy. We have known of a large English operation connected with the iron business suddenly influenced, disastrously to American interests, by a panic in Turkish funds. It is in hard times, when dull trade has made competition among makers desperate, that this unforeseeable, unpreventable, uncontrollable foreign incursion is most to be dreaded. And no matter how long an industry has been established, it needs to be protected at this weak point so long as it has a higher "primary cost" than its foreign rivals. The function of a tariff in encouraging "infant" industries is another thing. Perhaps that may require much higher duties than the function we are now describing. We are not now concerned to inquire how high the duty should be in any given case or how this question should be examined. In other words, when our own manufacturers are standing against each other face to face in a struggle for primary costs, they should be safe against flank and rear attacks.

As prices rise and competition is carried into the spheres of interest and profits, the duty which was prohibitory before need not be probibitory any longer. In these departments a fair fight is not feared by Americans. It will be seen that these conditions are met by a specific duty only, which thus appears, apart from its efficiency against Custom House frauds by undervaluations, to be the true means of a judicious protection. An ad valorem duty.

on the other hand, is either too high when prices are high, and favors "corners," to the injury of both the trade and the public, or it is too low when prices are low, and makes disaster more disastrous, operating thus at both ends to increase the oscillation of prices which disorganize and demoralize business.

The Business Cost of Pig Iron.

The statement of the items which enter into the cost of making pig iron has given rise to considerable discussion among those who conduct blast furnace enterprises, and is often utterly inexplicable to the outsider. The cost comprises:

1. The cost per furnace books.
2. The extra cost due to contingencies, accidents, interest on supplies carried, and interest on plant.
3. The selling expense, which includes the interest on the stock of pig iron carried unsold, the interest on sales from the date of sale to the date of payment, the guarantee fund for bad debts, the brokerage, the office expenses and the cost of loading on cars, since sales are usually reckoned at a price f.o.b at the works.

The first item is what is commonly included in the so-called estimates of the cost of pig iron issued by the promoters of new enterprises and adopted by amateur economists. Often these estimates do not even cover what the cost per furnace books should really comprise—namely, the cost at the furnace of ore, fuel and limestone, wages, salaries, supplies, and a renewal fund of such an amount per ton of pig iron as will on the average suffice at the end of the blast to put the furnace and machinery in good order for another. In cost sheets made for the information of proprietors only there should be also always an allowance for the inevitable shortage in fuel. Limestone is generally used from hand to mouth, and there is less chance of mistake or waste in regard to quantities. Ore is often accumulated in large quantities, and, being charged in small quantities, it is not likely that at the end, perhaps of several years, when an ore pile happens to be cleared up, the aggregate of the charges made by the barrowful will precisely equal that of the shipments received from the mines. The dump may overrun or fall short, and the precise fact may not be determined at the end of each year when the annual cost sheet is made up. It is impossible, therefore, to make allowance for it under this head, and it is usually omitted here and placed under the head of contingencies. But the fuel account is sure to show a deficiency by reason of the waste of coal and coke in handling, the dust not being charged into the furnace. The percentage of this deficiency varies according to the method of transportation and delivery, the amount of surplus stock of fuel necessary to be carried, &c. It is never safe, we think, to put it at less than 2½ per cent. on the amount of fuel reckoned by the number and weight of charges, and 5 per cent is a common and reasonable figure.

The renewal fund is another variable item, the amount of which must be fixed by experience. In prudent practice it ought to include a reasonable amount of improvements. At the end of a blast it is not only necessary to reline the furnace, patch the boilers and put the plant as nearly as possible in the same shape as at the beginning. This is the time when the ironmaster improves his tuyeres and connections, hot-blast stoves, an plant generally; and while the renewal fund is not expected to cover extensive reconstructions, it should cover such minor improvements incidental to repairs as experience has dictated. Of course a short, unlucky blast leaves an inadequate renewal fund, while a long and successful one accumulates more than is immediately required. We are satisfied that 50 cents per ton is not too much, and we know this is the amount charged to this account by some experienced managers. It is a mere question of bookkeeping, and some people prefer to put all such items in a construction account, which, if not properly considered, may lead simply to the steady increase of the fixed capital, and the final collapse of the business after years of delusive prosperity.

But when the cost sheet according to the furnace books has been honestly and safely made up, say at the end of the year (thus checking the weekly and monthly reports which all well managed works require as an approximate indication), there remain the other items we have enumerated. With regard to these we submit the following figures, taken from the books of a well-known, well-managed and solvent concern, and based on the actual business of a fairly prosperous and very recent year, during which many thousand tons of pig iron were made and sold. The items of interest have been calculated at 6 per cent. Careful analysis made by an expert and entirely disinterested accountant, shows the following result:

Extra cost and interest on plant and inventory.—The shortages discovered at the end of the year in old ore-dumps, &c., amounted to 38 cents per ton of pig iron made. But this was extraordinary, and it is estimated that for 15 years past, a fair average would be about one-third as much, or, say:

	Per ton.
Shortages and accidental losses, not otherwise accounted for	$0.12
Interest on inventory of ore, fuel, and supplies	.34
Interest on plant	.54
Total	$1.00

It will be observed that the first item is arbitrarily assumed, at a low figure, and that to this assumption only is due the suspicious roundness of the total.

Selling expenses.—These include the following items:

	Per ton.
Interest on stock of pig iron	$0.34
Interest on sales, 30 days	.09
Guarantee fund for bad debts	.27
Brokerage at 1 per cent	.17
Office expenses (not at works)	.06
Loading expenses	.15
Total	$1.08

The interest on an average stock held an average of four months was calculated, not on the selling price, but on the furnace cost. The interest on sales is on the period of 30 days, allowed without the interest to purchasers for the the settlement of accounts. The guarantee fund was deduced from the books for 15 years past and did not include exceptional instances.

The actual total of these two accounts during the year under consideration was $2.34. But the total of $2.08 which we have given is closer to the average of the past 15 years. During that period, we may add, the concern in question has been obliged to increase its actual investment both in fixed and in floating capital to an average of more than three times what it started with. The present figure at which the property and plant stands on the books is larger than all the profits of the 15 years, without counting interest on capital at all; and if the concern desired to go out of business to-morrow the net result of the whole enterprise would depend upon its ability to find a purchaser at its valuation of the property, which, although it is far less than the amount actually expended in improvements, no sane man would be willing to pay, except for the purpose of continuing the business. In other words, this valuation represents far less than the cost of property and plant, and much more than its intrinsic value. It is its "business" value, so to speak, and a permanently unfavorable change in the business situation would seriously reduce it. The gradual increase of such business valuations is the effect of competition and progress, diminishing the profits of capital and imperatively requiring a larger and larger scale of operation. The concern to the courtesy of which we owe this glimpse into actual practice is now making, per furnace in operation, about six times as much pig iron as in 1873.

It thus appears that the business cost of a ton of pig iron is, in the case we have analyzed, at least $2 more than the furnace cost. We cannot, of course, give names and details, but we can vouch for the accuracy of these figures, and from our knowledge of the general business we do not hesitate to say that they fairly represent the experience of really solvent enterprises in the manufacture of pig iron. Perhaps we should add that we have excluded from the above estimates the salaries of such officers as the president and secretary of the company, so as to make them applicable to individual concerns as well as incorporations. So far as such officials are ornamental, there salaries should come out of profits, and not be reckoned as part of the cost. It will be noticed, also, that the above estimstes assume no difficulty in getting any required amount of money at 6 per cent.—a condition which a good many iron manufacturers would be glad to encounter. On the whole, therefore, while single items of the estimates may be deemed large by fortunate makers here or there, we feel sure that the general total does not overstate the burden carried by established and well-managed concerns in this business—and quite ignored by the smart statisticians who know all about it.

The unconstitutionality of the "drummers' tax" has been affirmed once more by the Supreme Court, the case decided by Justice Bradley being this time that of W. G. Asher, a resident of New Orleans, against the State of Texas. The State courts had upheld the local law making it a misdemeanor for any person to do business as a commercial traveler without first having taking out an occupation license. The State authorities held that there were differences between the Robbins Tennessee case, and urged, too, that the latter was in conflict with prior decisions of the Supreme Court. Justice Bradley seems to have disposed of these contentions very

briefly by holding that the Tennessee and Texas cases were practically identical, and that "the court has always supposed that a later decision has the effect of overruling a prior decision with which it may not be in harmony" Thus a vexed question appears to have been finally and decisively put at rest. Any taxing of a commercial traveler, a resident of another State, is a violation of the right of the general Government to regulate Interstate commerce.

A Court of Patent Appeals.

Among the measures of deep interest to the business community which did not come up for consideration of Congress is the House bill, No. 9084, relating to a proposed Court of Patent Appeals, which has been ably advocated by George Ticknor Curtis. Its double object is to secure some relief for the overburdened docket of the Supreme Court and to allow of more thorough discussion of patent, trade-mark and label cases. During the last term of the Supreme Court, 25 out of 325 were patent cases. Allowing two hours for each side for oval argument, and making a fair estimate of the time consumed in studying them and preparing the decisions, two months' work, at least, out of a term of eight months, was occupied by the highest court in the land, crowded as it is with important cases. It is urged with much show of justice that the greater part of the work thus devolving on the Supreme Court is the determination of questions of fact which couldbe as readily and as authoritatively decided by a special court, leaving the decision of questions of law to the highest tribunal. The testimony in patent suits is often very voluminous and conflicting, involving a wide variety of intricate mechanical and scientific subjects. Careful application to their study is expected to allow Supreme Court justices to master them without much difficulty, but certainly at a considerable sacrifice of time. No one who has even as an expert gone over the testimony in hotly contested patent suits will fail to appreciate the labor which an effort to master them must involve to one earnestly seeking to discover the truth.

To relieve the Supreme Court, and at the same time allow of an oral presentation of the facts not fettered by the present two-hour rule, the Patent Court of Appeals is proposed. It is not to be a board of experts, but it is to consist of three justices, lawyers, preferably men who have had experience in patent cases. They are to constitute an appellate court, to which, first of all, appeals from the decisions of the Commissioner of Patents in interferences are to go. As it is now, the inventor who believes that justice has not been done him in the Patent Office must appeal from its chief directly to the highest tribunal of the land. The proposed court would be a special and permanent tribunal for the revision of decisions made by the Patent Office. Composed of men trained to this peculiar duty, the new court would do away with the uncertainties in the construction and administration of rules of practice which have been inevitable in consequence of periodical changes of the Commissioner.

The proposed Court of Patent Appeals would be interposed also between the courts of original jurisdiction, the Circuit Courts and the Supreme Court. Of course litigants retain the right to appeal finally to the Supreme Court, but the latter will deal only with questions of law and not with questions of fact. These must and can be argued at length, and to much better advantage to all parties concerned before the proposed tribunal.

Mr. Curtis has submitted the details of the bill to the justices of the Supreme Court. He has received from them suggestions which have been adopted and has secured their approval of the measure, which has been reported by the Judiciary Committee of the House. The manufacturing industries of the country can only look with approval and give their support to a proposal which holds out the promise of making less intolerable the law's delays.

Our Trade With American Countries.

The Bureau of Statistics, at Washington, has just published particulars of our import and export trade with all American countries during the fiscal year ended June 30 last. On comparing them with those of the previous fiscal year and arranging them accordingly, in tabular form, we arrive at some interesting and important facts. One important point should be taken into consideration, however: Shippers of goods by rail to Mexico and to the Dominion are not under any obligations to declare the quantity and value of their exports. The result is that the official returns are far below the actual amounts, as comparisons of American and Canadian figures and American and Mexican returns regularly show. Besides this, the smuggling trade is said to be of some magnitude.

U. S. Trade with Canada, Mexico, the West Indies, Central and South America.

	Import—Thousands of dollars.		Domes. Exp't. Thousands of dollars.	
	1888.	1887.	1888.	1887.
Argentine Republic.	5,902	4,100	6,099	5,671
Brazil	53,710	52,953	7,064	8,072
Chili	2,895	2,863	2,423	2,063
Costa Rica	1,609	1,410	1,065	704
Cuba	49,519	49,515	9,724	10,139
Porto Rico	4,412	4,062	1,920	1,707
Ecuador	1,119	1,131	811	1,049
Guatemala	2,085	2,649	888	553
Honduras	959	858	673	426
Hayti	2,919	1,753	4,323	3,059
Mexico	17,330	14,720	9,242	7,267
Nicaragua	1,496	1,662	861	701
Colombia	4,393	3,951	4,923	5,974
Peru	309	462	865	718
Salvador	1,473	1,059	645	477
Santo Domingo	1,459	1,380	793	1,014
Uruguay	2,712	2,819	1,337	1,394
Venezuela	10,051	8,261	3,008	2,827
French Possessions	129	408	1,715	1,334
Danish Possessions	399	501	603	605
British Possessions	58,641	52,629	43,856	41,733
Dutch Possessions	820	739	845	772
Totals	224,141	210,485	103,683	98,259

The import has increased from $210,485,000 to $224,141,000, a difference of $13,656,000, or about 7 per cent., chiefly due to the advance in coffee and sugar, as hides have only improved since June. The domestic export rose from $98,259,000 to $103,683,000, a gain of $5,424,000, or 5 per cent. In other words, the greater absorption of American goods has nearly kept pace with the appreciation in the value of products we receive from the rest of America, which is highly satisfactory, and augurs well for our domestic export during the current fiscal year in our business intercourse with those countries. This is all the more likely because coffee, sugar and hides have continued to bring good prices in the United States and Europe, causing general prosperity in the producing countries. Returning wealth to impoverished planters and stock raisers makes a great difference in our dealings with the commission merchants and shopkeepers in Spanish America and Brazil. Steamship lines in that direction have also been multiplying; soon there will be one under the Argentine flag.

We have, for the sake of further elucidation of the subject, prepared another table, showing the trade which the rest of America did with foreign countries in 1886. We append to it one exhibiting their population, which in the aggregate is only less than ours by a couple of millions.

Trade of Canada, Mexico, the West Indies, Central and South America in 1886 with Foreign Countries:

	Population.	Imports. Thousands of dollars.	Exports. Thousands of dollars.
Argentine Republic	3,435,286	95,408	69,835
Brazil	12,932,375	106,651	105,279
Bolivia	1,952,079	872	1,228
Chili	2,526,969	48,233	52,683
Costa Rica	182,073	2,882	2,629
Cuba	2,306,393	46,170	64,800
Porto Rico	800,000	11,745	14,049
Ecuador	1,204,651	4,162	4,773
Guatemala	1,357,900	2,686	5,591
Honduras	458,000	1,245	1,328
Hayti	800,000	4,121	6,271
Mexico	10,447,974	31,600	34,483
Nicaragua	400,000	1,462	1,945
Colombia	3,000,000	14,000	8,000
Peru	3,000,000	9,184	6,616
Paraguay	1,337,436	1,216	1,178
Salvador	651,130	2,428	4,755
San Domingo	504,000	2,104	5,544
Uruguay	596,463	20,316	23,944
Venezuela	2,198,320	9,433	16,461
French Possessions	383,132	13,000	20,000
Danish Possessions	33,763	1,219	500
British Possessions	6,215,005	155,255	134,255
Dutch Possessions	113,300	2,800	2,700
Totals	56,836,252	588,192	588,847

The import was $588,192,000 and the export $588,847,000, nearly alike, but since that year the rise in products must have caused a greater volume, probably in about the same ratio as the expansion of our commerce with them. On comparing our total American trade in the fiscal year, 1887, with their total trade in the calendar, 1886, we find that the former was $308,744,000, and the latter $1,177,039,000. In other words, the latter was nearly four times the former. Our share in the American trade certainly should be larger, extensive though it may be, and we trust that a gradual favorable change will take place in this respect, situated as we are, and receiving such an enormous amount of colonial and other produce. Leaving this desideratum to be worked out by our activity and geographical position, as well as the excellence of our goods, it is gratifying to note that since the Centennial we have made considerable headway in exporting our merchandise to the countries named, that consequently what has been accomplished fully justifies the very best expectations for the future.

A matter to which attention was directed in a marked degree during the recent Scranton Meeting of the American Society of Mechanical Engineers was the utilization of coal dust as fuel. The accumulations throughout the coal regions have frequently been suggestive of very acceptable profits in places where efficient

means could be provided for burning the dust, especially under steam boilers, and attempts have not been lacking to develop a system of furnace practice which would meet the requirements. It is of some interest, however, to observe that no uniformity has been established in the accepted methods, and while one way of firing, say with large grates and slow rate of combustion, may have been found to give satisfaction in one place, exactly the reverse may be true in another. But the principal points appear to be the use of a shaking grate and the maintenance of a thin fire, so that cleaning can be readily effected. It is by these means that culm is being used so satisfactorily for steam raising at the works of the Lackawanna Iron and Coal Company, at Scranton, though it is but fair to state that the dust there is mixed with pea and buckwheat coal, for which the company can find no ready market. Forced draft on the closed ash-pit system is employed, and the boiler plant seems to give entire satisfaction. The question of comparative economies cannot, however, be at all considered in this particular case, since to burn the dust is there the most inexpensive way of getting rid of it. Something like 5000 tons of the mixture are consumed per month, the cost of the power being practically nothing except that of attendance. The conditions for a like record are, of course, not obtainable in all cases, but there certainly are many establishments where the dust, though possibly low in calorific value, might be burned to advantage, and under nearly equally favorable circumstances. We do not ignore the fact that, weight for weight, the culm may be so poor in quality, as compared with much higher priced coal, as to make its utilization not worth considering—in fact, unprofitable at any great distance from the base of supply, a much larger quantity of it being necessary to accomplish a certain result than of coal. It has not, however, been proven by any means that the dust, as a rule, is so poor a heating agent. It is eminently desirable that some good use should be found for it, and, while in the line of fuel briquettes and other forms of so-called artificial fuels it has not found an extensive field of appplication, it does not seem too much to expect its much wider and successful use as a fuel directly, especially in steam boiler furnaces.

Speculative Railroad Directors.

No single cause has contributed more largely to check the feeling of buoyancy in the business world than the happenings in the management of a few large railways during the past few months. Complaints of the doings of speculative boards of directors are not new. Yet, the public receives a violent shock every time when insiders are forced ultimately to give an account of their stewardship, and it becomes impossible to conceal that the finances of great corporations have been allowed to drift into a frightful condition. It is true that, in the majority of cases, suspicion rests on roads whose managers are prominent in operations in Wall street, who are liberal with "points" and are eager to parade in the newspapers and on the tape their strong convictions of coming prosperity. The country has witnessed the spectacle of men, high in standing in financial circles, putting themselves on record in the most unqualified way, when they must have known that they were deliberately deceiving the public and their friends. Striking instances of this kind have happened in the past six months. They have done much to unsettle confidence at a time when the outlook seemed to warrant a bright future. Sharp practice like this cannot be too vigorously condemned. It is only too often accompanied by the cooking of reports of earnings and financial statements, and those who profit by stock operations during the period of concealment are only too apt to aid the demoralization following the final revelation of the truth for selfish purposes.

Another class of directors are those who autocratically handle the property committed to their charge with the best of motives. Long years of successful management may have bred a confidence and a pride which shrinks from acknowledging an error of judgment. Straining well-earned confidence and credit to the utmost to cover defeat or to tide over embarassment, they are apt to surprise their friends and their enemies alike by startling developments. The difficulties into which one prominent system has been plunged lately will illustrate the dangers to investors and to the business interests of the country of such management. We attribute to such happenings as these the halt noticed for some time past in the rising tide of general prosperity. They are incidents which may delay but cannot in the long run arrest the movement. In nearly all the departments of the iron trade there is a hopeful feeling which augers well for the future in spite of the setbacks which some of the developments in railroad circles have created.

English Competition in an Unexpected Quarter.

Under the provisions of the existing tariff, foreign competition in our domestic markets has been practically eliminated in many branches of the iron and steel trades. Tin plates, it is true, are wholly monopolized by foreign manufacturers, and cotton ties and wire rods are also largely in their hands, together with spiegeleisen and ferromanganese. We also purchase abroad considerable quantities of pig iron and steel rails whenever the consumption of these articles is so heavy that prices rise above the importing point. But in a very long list of iron and steel manufactures foreign competition has so completely disappeared that no apprehension is usually entertained of opposing bids being received from that source on domestic contracts. And, among them all, no interests have felt more secure in the impregnability of their position than the iron founders producing castings for every conceivable purpose. It is, therefore, with something of a shock to their serenity that they heard last week of the probability of a contract for 5000 tons of castings for a cable street railway in Denver being taken by English foundrymen. It is all the more aggravating to our domestic foundrymen, too, from the fact that these castings are not to be used on the seaboard, or only a short distance in the interior, but in the very heart of the continent, at a point so remote from seaports that the inland freight rate is in itself a serious burden on the foreign manufacturer.

The contract in question was one of sufficient magnitude to invite bids from a large number of domestic foundrymen. Among the competing establishments were foundries in Chicago, St. Louis, Cincinnati, Kansas City, Omaha, Belleville, Ill., and Birmingham, Ala. No less than four Chicago concerns were represented among the bidders. The Chicago people confidently expected the contract to be secured by one of their number. They made very close bids, being anxious to have this work for the coming winter, when they would have little to do in their own specialty of architectural ironwork. A very low rate of freight from Chicago to Denver was also negotiated, the railroad companies being willing to do what they could to secure the work for Chicago and the freight for their lines. The lowest figure from American bidders is understood to have been made by the Chicago foundries and was under $39 per ton of 2000 pounds, delivered in Denver, with a $9 rate of freight between the two points. This was based on a cost of about $16 per ton for pig iron at Chicago. Even Birmingham, Ala., with its very cheap pig iron, was unable to get under this Chicago bid. Yet English foundrymen, despite the duty, underbid the lowest American bidders about 90 cents per ton, through a broker in Kansas City. It is stated that they expect to ship the castings from Liverpool to Denver, via Galveston, for about $7 per ton, or $2 less than the rate from Chicago to Denver. The ratification of the contract is now awaiting the settlement of this freight rate.

An interesting question arises as to the rate of duty which will be paid on these castings. They consist mainly of yokes, so shaped as to support the track rails on their extended arms, the slot rails on central uprights, and the cable tube in an oval base. If they are wholly of cast iron it is difficult to see how they can pass the custom house at any other rate of duty than 1¼ cents per pound under paragraph 157 of the Indexed Tariff. As it is asserted, however, that they will be imported at 45 per cent ad valorem: it is probable that they will be changed slightly from the condition of mere castings, so that they can be brought in as manufactures of iron under paragraph 216. If the duty of 1¼ cents per pound should be imposed, it is evident upon very superficial computation that it would be impossible to import them at the price at which they are to be delivered. These facts will develop in time, as the occurrence is so important that it will not be allowed to pass wholly out of sight by the foundrymen interested.

Of vastly more importance than this one contract is the certainty of future foreign competition in a hitherto unaffected branch of trade, if it is carried through with satisfactory results to the English foundrymen and the Denver Railway. There is room for trouble in the adjustment of the proper tariff rates, in making sufficiently prompt deliveries, in supplying acceptable castings, and in figuring up a profit after the contract has been fulfilled to the letter. Should all these problems be solved in their favor, the groundwork will then have been laid for a large business in America by English foundrymen. They

would not touch a great deal of special work, and ordinary jobbing would not invite their competition, but carwork and bridgework and any other classes of castings made from standard patterns, and for which contracts are often given out in large quantities, would be open to them. With their very cheap pig iron and their very cheap labor and low Transatlantic freights, a 45 per cent. duty can be overcome in reaching this market. If, however, the duty of 1¼ cents per pound, which appears to be the true rate on castings, should be imposed by the customs officers, our foundrymen will have no reason to fear outside competition, and can continue to pay their molders good wages on the American scale.

New Routes to Mexico.

The opening for through traffic from the United States boundary to the city of Mexico by the Mexican National Railroad Company is an event of more than ordinary importance in several respects, especially in bringing the two countries into closer commercial relations. The Mexican National has been in progress since the time of the opening of the Mexican Central, some four years ago, but the work was seriously retarded by the financial embarrassments of the Mexican Government, and was not pushed with vigor until English capital was enlisted and a new organization effected, so that within less than a year 352 miles of road have been built, connecting the sections which had been operated practically as independent lines. There are now in fact three separate routes from the United States to the Mexican capital, including the Mexican International, whose northern terminus is at Eagle Pass, from whence the track extends 384 miles to its intersection with the Mexican Central at Torreon. The three border cities, El Paso, Eagle Pass and Laredo, from henceforth will aspire to lead as centers for traffic with "our nearest neighbor."

The completion of the Mexican National is an event that more directly concerns points like St. Louis and Kansas City in the West and Galveston and New Orleans on the Gulf, which must ultimately derive important advantages from the inviting fields of enterprise which are now brought near to their doors. St. Louis, for example, now finds herself about 1900 miles from the Mexican capital and Kansas City about 1800 miles. This is a gain from 600 to 800 miles compared with the El Paso route. Taking into consideration the improved financial condition of the Mexican Government, which enables it to meet its obligations with promptitude, since the resumption of subsidy payments to the railroad companies two years ago, also the stimulus derived from new capital and the introduction of modern means of transportation in lieu of mule-packs, it is not unreasonable to expect a growth of traffic in that direction far beyond anything in former experience. To what extent the United States may be able to share in the trade of Mexico in competition with Europe, whose steamship lines concentrate at Vera Cruz, becomes an interesting question. Much depends probably on the consummation of the proposed reciprocal treaty.

It is not without interest to note that the Wheelock valves on the oscillating engines of the new Sound steamer Connecticut are 9 feet long.

CORRESPONDENCE.

Train Service and Accidents.

To the Editor.—The recent railroad disasters in Pennsylvania have, according to the testimony before the coroner's juries, demonstrated that carelessness borne of familiarity may bring to nought the intention of any system of rules arranged to protect the property of the railway company or the lives of its passengers. The lessons which these accidents teach offer a timely opportunity for some suggestions as to similar disasters which are daily invited by failure to carry out what are considered as the minor details of regulations adopted for the safety of travel. The business man, who spends a large portion of his time on railroad travel, and who is at all observant, can, on almost any trip, note some failures to carrry out to the letter important regulations, and a few such may be mentioned.

It will probably be a surprise to most of those who travel between New York and Philadelphia to learn that heavy passenger trains of eight and nine cars are constantly run from one city to the other, on which the conductor has but one brakeman to assist him, in spite of the existence of a law of the State of New Jersey. When the conductor is taking up tickets from the rear cars, the brakeman is front; and, in case of the train coming to a stop, he must either jump from it before its movement entirely ceases, or waste what may be precious moments in reaching the rear of the train. If the brakeman goes back when the train stops, his reliance upon the system of signals encourages him to move with deliberation and even return before the signal is given from the engine. An instance of this occurred within ten days. Travelers in sleeping cars are familiar with the attractions they offer to trainmen, and instances may be mentioned where, on Western and Southern railroads, noted for long hours of continuous duty, the brakeman, whose place was at the rear of the train, was found asleep in the sleeping-car.

A gentleman, traveling on a branch of one of our prominent Eastern railroads during the present month reports that, at a grade crossing of another railroad, the conductor sat in the car reading a paper, while the brakeman attended to discharging passengers, came in to report that the connecting train was 9 minutes late and had 3 passengers. To this the conductor responded, "Pull ahead a little," and continued his newspaper perusal, while the brakeman signaled the train forward, then had it back to the station, when the connecting train arrived, received its passengers, and started the train on its journey. The conductor never left his seat until he went to collect tickets, and yet this was a branch of a railroad whose reputation for strict discipline is unequaled in the country.

The question which these instances suggest is: Are not the heads of departments contributory to this neglect by their failure to acquaint themselves with the method pursued by subordinates? The official's duty keeps him from devoting much time to travel, and, when he uses the road, it is generally in a special car or train, or, at all events, seldom in the cars which are patronized by the bulk of those who use the road, and these details of discipline escape his notice. If the officials upon whom the conductors, brakemen, engineers, switchmen and other employees depend for their positions could acquaint themselves more intimately with the manner in which the regulations are carried out there would be fewer opportunities for serious accidents, and the statement that our railroads are "run by Providence, with a little help from the superintendents," would be further from the truth than it is now. J. B.

Tariffs of Transcontinental Lines.

The Interstate Commerce Commission, by Walker, Commissioner, has made public the result of its examination of the new transcontinental tariffs which were put in effect September 1, 1888. After stating the point of the former decision in the Denver case, that rates from San Francisco to Denver higher than the rates from San Francisco to Kansas City are not permissible under the short-haul clause of the act to regulate commerce, and showing that the new tariffs are clearly made in pursuance of an honest effort to conform to the provisions of the act as interpreted by the commission, the opinion proceeds to examine the details of the new system, which were not known to the commission until after they were put in force. The difficulties which arose at Chicago, St. Louis and other interior points from which rates were established to the Pacific Coast higher than the rates from New York City, are explained to have arisen from a series of commodity tariff which named articles on which low rates were made from specified points, leaving all other articles and points subject to the class rates under the Western classification.

In respect to these special tariffs the commission rules as follows: Rates that are just and reasonable from selected manufacturing points, through the entire territory east of the Missouri River and west of the Atlantic seaboard are *prima facie* just and reasonable from all other points in the same territory. A tariff naming a rate from one locality lower than that enjoyed by its neighbor, when circumstances are the same, tenders a preference or advantage to the first; and, when any shipper is damaged by the exaction of any additional burden, the preference becomes undue and unreasonable, unless it can be justified upon some sound and substantial ground. Common carriers are under obligations to take all descriptions of ordinary traffic from all points, and it is right that the rates should be known and announced publicly in advance of the offering of traffic. Under the act to regulate commerce shippers are not to be put in a position of subserviency to common carriers, nor required to ask for rates, but are entitled to equal and open rates at all times. Discriminations are made and undue advantages are given by the special tariffs in question in giving different rates to places named and those not named, to manufactured articles named and those not named, to jobbers at places named and those not named, to manufacturers and to jobbers and other dealers. The opinion further states that these conclusions were made known on October 16 to representatives of the transcontinental lines at an interview arranged for that purpose, and were at once acceded to, the modified arrangements suggested by the commission as to west-bound business having gone into effect on October 23.

N. J. Mitchell, interested with M. V. Smith, metallurgical engineer, of Pittsburgh, is at the head of a movement to organize a scientific iron, steel and engineering society, to consist of young men between the ages of 18 and 25 years. This society is for the mutual instruction on everything pertaining to the above subjects, including mining and working of metals, civil and mechanical engineering, as well as the application of electricity. Young men of the above ages interested in such a movement will please address N. J. Mitchell, Hamilton Building, Pittsburgh.

Washington News.

(From Our Regular Correspondent.)

WASHINGTON, D. C., October 30, 1888.

After years of effort by the War Department the question of the country's defences has at length taken tangible form in the appointment by the President of the Board of Ordnance and Fortifications provided for by the Fortification Appropriation act. The board, as already announced in general orders of the Adjutant-General's office of the War Department, consists of Major-Gen. John M. Schofield, General Commanding the Army, Col. Henry L. Abbott, Corps of Engineers; Col. Henry W. Closon, Fourth Artillery, and Lieut.-Col. Alford Mordecai and Capt. C. Morrison, Ordnance Department.

The act of Organization and Appropriation provides that the Board shall prepare suitable regulations for the inspection of guns and material at all stages of manufacture to the extent necessary to protect fully the interest of the United States. The order appointing the board provides that expenditures shall not be made or contracts entered into involving the Government in an aggregate expenditure exceeding $6,500,000, nor an expenditure on the part of the Government in any one fiscal year in excess of $2,000,000, and all guns and materials purchased under authority of this order shall be of American production and furnished by citizens of the United States.

The board has held a meeting for organization and expects to proceed at once in the prosecution of the objects for which it was created. It will begin operations by a careful review of the most advanced systems of defenses and plans of fortification in practical use by the great warlike nations of the globe, for the purpose of utilizing in a scheme of seacoast and frontier defense all the best features of known systems, with such improvements as the abilities, experience and skill of our own officers may suggest. The board will also take up the subject of defensive armaments for land defenses, high power ordnance, improved projectiles and warlike explosives.

The labors of the board in the end will involve large orders of iron and steel in the various forms required by modern defenses and guns. A member of the board, speaking on this subject, said: "It is well established that stone defensive works are practically useless. It is also conceded that earth works easily repaired are of merely temporary, uncertain and very doubtful means of defense against the destructive explosives discovered and devised by modern research and chemical skill. Therefore, the only recourse will be the designing and adaptation of steel armor for land defenses the same as for ships, the construction of floating batteries which can be moved about harbors or be operated along the seacoast and various other defensive contrivances." The officer remarked, further, "Now, all this will create an immense demand for iron and steel, which should be of enormous advantage to the iron industry of the country." It is expected that the board will be able to submit a preliminary report by the time of the meeting of Congress, although no further legislation nor voting of money will be required until the present $6,500,000 available shall have been expended.

Tobin Bronze.—The Ansonia Brass and Copper Company, of 19 and 21 Cliff street, New York, have brought out a new bronze, the Tobin bronze, which they sell in the form of sheets and plates, rods, wire, seamless tubes and ingots. The latter are of three qualities, which are suitable for a large variety of purposes. A test made by Professor Thurston shows a tensile strength of 67,600 pounds per square inch of original section. A series of tests made of hot rolled Tobin bronze by a board of naval officers gave a tensile strength varying between 58,734 and 59,905 pounds, and 5.5 to 5.625 per cent. elongation, crosswise, and between 54,704 pounds and 62,389 pounds tensile strength and 4.5 and 7.375 per cent, elongation in the direction of its length.

OBITUARY.

HENRY W. OLIVER, SR.

Mr. Henry W. Oliver, Sr., one of the oldest residents of Pittsburgh, died at his home in Hazelwood, a suburb of that city, on Thursday, the 25th inst., in the eighty-second year of his age. The active cause of his death was pneumonia. Mr. Oliver was born in the year 1807, at Tattykeel, parish of Killdress, County Tyrone, Ireland. He married Margaret, daughter of David Brown, Esq., of Donoughmore, and settled in the town of Dungannon, where he became an influential citizen. Political opinions caused him emigrate to America, and he settled in Pittsburgh, 1842. He was engaged in the saddlery and harness business on Wood street until 1865, when he retired from active life. He represented the Twenty-third Ward in Council two terms, and was appointed by the Judges of the Courts of Common Pleas as a member of the Board of Viewers in 1877, to which position he was reappointed for 11 successive terms. His wife, with his four sons, David, Henry, James and George, the well-known iron manufacturers of Pittsburgh, and two daughters survive him.

PHILIP R. GEORGE.

Philip R. George, for over 40 years the manager of the mining interests of Cooper, Hewitt & Co., died suddenly of disease of the heart last Sunday evening, at Ringwood, N. J., where he has resided for the last 35 years. Originally a Cornish miner, by force of his ability, strict integrity and great energy he rose to the important position of manager of the most extensive and important mines in New Jersey. Mr. George was 68 years old.

Efficiency of Steam at High Pressures.

In an interesting paper on "The Efficiency of Steam at High Pressures," presented by Mr. W. W. Beaumont, at the recent meeting of the British Association for the Advancement of Science, it was attempted to show that the Carnot theorem as expressed by the equation

$$E = \frac{T - t}{T}$$

is inapplicable for the calculation of the efficiency of steam as used in a steam-engine cylinder. It is shown that the work done by expanding steam bears no relation to the fall in temperature due to fall in pressure, and that the dymamic and thermodynamic values of steam working expansively do not approach each other until an absolute pressure of over 200 pounds per square inch is reached. The relative dynamic values calculated by isodynamic or by any of the forms of the adiabatic formulæ, are not even approximately equal; but, with steam at pressures between 350 pounds and 50 pounds per square inch the work done by expansion varies from 692 foot-pounds to 900 foot-pounds per degree of fall in temperature.

In falling from 350 pounds to 300 pounds, the expansion work of a pound of steam is taken as 10,372 foot-pounds, while the fall in temperature, 15°, represents (taking the specific heat of steam for purposes of illustration as 1) 11,380 foot-pounds. In falling from 100 pounds to 50 pounds, the expansion work done is taken at 49,280 foot-pounds, while the fall in temperature being 46.8°, the mechanical equivalent is 36,130 foot-pounds. In the former case, then, there is a difference of 1008 foot-pounds between the dynamic and thermodynamic work, the latter being the greater, while in the second case there is a difference of 13,150 foot-pounds, the dynamic or expansion work being the greater. Thus, at the lower pressures, the fall in temperature is much too small to account for the work done by expansion, while at the high pressures the fall in temperature is more than sufficient. Condensation of steam to provide for this difference must therefore take the place in the lower pressure engine cylinders. The argument leads to the conclusion that pressures higher than those now used can be very advantageously employed. When the exchange of heat due to difference in latent heat, total heat, and temperature at the different pressures is taken into account, the difference in favor of the high-pressure steam becomes much greater. An explanation is afforded of the great efficiency of triple stage expansion engines as compared with the lower pressure simple engines, and of the greater efficiency of the steam jacket on low-pressure engines than on high-pressure engines. It is clear that the steam in the steam engine must be considered with reference to the heat used, and not to the fall in temperature.

The McClure Coke Company, of Pittsburgh, have posted the following notice on their coke plants in the Connellsville region: "On and after November 1, 1888, until further notice, the following wages will be paid at the works of the McClure Coke Company: Mining and loading room coal, per 100 bushels, 85 cents; cagers, per run, $1.78; drivers, shaft and slope mines, per run, $1.78; drivers, drift mines, $1.70; track-layers, shaft and slope mines, per day, $1.78; track-layers, drift mines, per day, $1.70; trappers, per day, 64 cents; inside laborers, per day, $1.57; coke-drawers, per 100 bushels charged, 51 cents; levelers, per oven, 9 cents; car forkers, per car less than 40,000 pounds capacity, 90 cents; 40,000 pounds capacity and over, $1.05; yard laborers, per day, $1.27." The foregoing is an increase of 6¼ per cent. over the present scale of wages. The J. M. Schoonmaker Coke Company, of Pittsburgh, have also posted a similar notice on their various works.

An Artificial Colliery.—One of the novel features of the Paris Exposition is to be an artificial colliery. During the descent into the mine the visitor is to be made the subject of an illusion. The sides of the artificial shaft will be formed of canvas painted to show the stratification in a typical deep pit. The cage begins to descend with a considerable velocity, but is brought gradually to rest within a few yards of the pit bank. As the motion of the cage is retarded, the canvas sides of the shaft are drawn up with increasing velocity, the acceleration being proportional to the retardation of the cage. The effect upon the spectator standing upon the deck of the cage is one of continued descent at the same speed at which he started, and the illusion is kept up after the cage comes to rest by a movement of trepidation communicated to the latter. The illusion is said to be perfect. When a great depth has apparently been reached, the canvas is brought to rest gradually, the trepidation of the cage being made to cease at the same instant. The visitor, who believes himself to be deep in the bowels of the earth, then steps out of the cage and enters the workings, where he may see the various operations of coal-getting.

TRADE REPORT.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St.,
PHILADELPHIA, Pa., October 30, 1888.

The past week has been fairly satisfactory on the whole, although there is not that buoyancy which characterized the market earlier in the month. Still, prices are steady, and for the present everything goes directly into consumption, so that there is no accumulation of stocks, nor any scarcity of business at about current quotations. Considering that this is the last week of the month, and the week preceding the election, the comparative dullness ought not to cause surprise, although it may give rise to a little uneasiness until the matter is settled. But the general feeling is hopeful, and it is believed that the outlook is such as to warrant at least a continuance of a volume of business such as we have had during the past two or three months

Pig Iron.—A very considerable business has been done during the week, and in most cases at full quoted rates. There is also a good deal of inquiry for quotations on large lots, although it is hardly likely that they will be closed until after the election; then it will depend upon circumstances. As regards what may be the outcome, there is absolutely no basis upon which to form an opinion until the election is over. Sales during October appear to have been very much larger than the output, probably nearly double the amount, so that the coming month's business will be of unusual importance in dedetermining the exact position. As matters now stand the balance of the year's output is practically all sold. Prices therefore, need not suffer under a very light business during the next few weeks, but the attitude of buyers will soon determine that point. If they decide to place orders during the early part of November, a very firm, if not a higher, market may be regarded as certain, while hesitation or procrastination will be just as likely to have the opposite effect. For the present, sellers show great firmness. Quotations are closely maintained and no inducements offered to effect sales beyond what are usual, as in the case of large buyers or to regular customers. As a matter of fact, sellers are about as much afraid of an advance as buyers are of a decline, which in some measure accounts for the uniform firmness with which prices are maintained. Sales during the past week have been made chiefly at $16.50, $17.50 and $18.50 @ $19, at tide, for the three grades, but some good brands have been made available at $16, $17 and $18, while others of a specially desirable character have brought $17, $18 and $19.50, according to circumstances. The feeling is decidedly firm, and at the moment concessions are not taken into serious consideration.

Blooms.—There is no change in prices, which are about as follows: Nail Slabs, $29 @ $29.50, at mill; Billets from $32 to $36, according to analysis; Charcoal Blooms, $52 @ $54; Run-out Anthracite, $42 @ $44; Scrap Blooms, $32.50 @ $34 ₽ "bloom" ton of 2464 lb. Foreign at tide, c.i.f., duty paid, $30 @ $31 for Nail Slabs; $34 @ $36 for 4 x 4 Billets, and $35 @ $39 for Siemens-Martin, price according to analysis, &c.

Muck Bars.—There is still something of a scarcity, and sellers are asking from $30 to $30.50, delivered, for good Bars. Buyers are holding back, however, and, while one or two sales have been made at these figures, there are evidences of hesitation, if not of weakness, at the prices named.

Bar Iron.—The demand is not quite as active as it was earlier in the month, and prices seem to be a trifle easier. This is perhaps more in appearance that in fact; first, because the quotations recently given were more or less nominal, and, second, because the figures now realized are decidedly better than those obtained some time ago for a similar class of orders, which are now about completed. For instance, mills that were loaded up with business at 1.75¢ would make their quotations 1.85¢ @ 1.90¢ on such small lots as they could sell. Now that they are open for large orders they accept 1.8¢ @ 1.82½¢, which, as a matter of fact, is an advance, although at first sight it looks like a decline. Quite a large amount of business has been taken under these conditions, and in many cases mills are again filled up for some weeks to come. There are others, however, that are on the watch for new business, and there is little doubt that buyers can do better than seemed likely two or three weeks ago. Some, of course, hold their prices with absolute firmness, but there are others who are either differently situated or who take a different view of the market. Prices are therefore irregular, varying from 1.85¢ to 1.95¢, according to circumstances, with still lower figures in exceptional instances. Skelp Iron is unchanged, 1.95¢ to 2¢ asked, with sales at the inside quotation.

Plate and Tank Iron.—A good deal of activity is reported in small lots, but large orders are still "in the near future." Mills are very busy, nevertheless, and the chances are favorable for their remaining so to the end of the year. It is understood that large orders from the shipyards will be placed during the early portion of the month, which will be sufficient to place the mills in a very independent position for some time to come. Meanwhile the constant demand from the smaller class of trade aggregates a nice amount from week to week and keeps prices steady and firm as follows: Ordinary Plate and Tank Iron, 2.05¢ @ 2.15¢; Shell, 2.4¢ @ 2.5¢; Flange, 3.5¢; Fire-Box, 4¢; Steel Plates, Tank and Ship Plate, 2.3¢ @ 2.4¢; Shell, 2.7¢; Flange, 3¢ @ 3¼¢; Fire-Box, 3½¢ @ 4½¢.

Structural Iron.—The feeling is a trifle easy in this department. Old work is being rapidly finished, but is not replaced as fully as could be desired with new orders. There is the usual talk of new things to come, but for the present the outlook is uncertain and not as encouraging as was expected some time ago. Prices are about as follows: 2.10¢ @ 2.15¢ for Bridge Plate; 2¢ @ 2.10¢ for Angles; 2.6¢ @ 2.7¢ for Tees, and 3.3¢ for Beams and Channels, Iron or Steel

Sheet Iron.—There is a very good demand, and stocks are so light that mills are kept fully employed in meeting the demand for small lots to assort up with. Prices are firm at about the following quotations:

Best Refined, Nos. 26, 27 and 28	3¼ @ 3⅓¢
Best Refined, Nos. 18 to 25	3 @ 3¼¢
Common, ¼¢ less than the above.	
Best Bloom Sheets, Nos. 26 to 28	4⅓ @ 4¾¢
Best Bloom Sheets, Nos. 22 to 25	4 @ 4¼¢
Best Bloom Sheets, Nos. 16 to 21	3⅔ @ 3¾¢
Blue Annealed	2.8 @ 3 ¢
Best Bloom, Galvanized, discount	62½ %
Common, discount	67½ %

Steel Rails.—The feeling is somewhat unsettled, and buyers and sellers appear to be a good way apart in their views. Manufacturers find the cost of production steadily hardening, and they begin to think that they ought to have prices to compensate, hence they are not inclined to meet the views of those who are talking lower figures. Ores are scarce and dear, and as the prospects of a decline are somewhat remote makers of Rails are not offering anything below $29, and intimate that they must have that or more, or close their mills. So far as this market is concerned the feeling is undoubtedly firm, based more on the high cost, however, than on any immediate prospect of an increasing demand.

Old Rails.—Nothing doing in this market, but the general position is the same as for weeks past. Lots in store are held at $24 and upward, while buyers seem to get what they require from other points at prices ranging from $24 to $25, delivered at mills. Bids of $23 @ $23.50 can be had for T's on cars or to arrive, with sellers as above noted.

Scrap Iron.—There is plenty of demand at the prices quoted last week, which are again repeated, as follows: $21 @ $21.50 for cargo lots; $21.50@ $22.50 for carload lots, delivered, or for choice $23; No. 2 do., $14 @ $15; Turnings, $13 @ $14; Old Steel Rails, $20 @ $21; Cast Scrap, $15 @ $16; do. Borings, $9 @ $10; Old Fish Plates, $25 @ $26. Old Car-Wheels, $17 @ $18, Philadelphia, or its equivalent.

Merchant Steel.—The demand is well maintained at prices as follows: Tool Steel, 8½¢; Machinery, 2.6¢; Crucible Spring, 4½¢; Crucible Machinery, 5¢; Best Sheet Steel, 10¢; Ordinary Sheet, 8¢.

Wrought-Iron Pipe.—There is still a very active demand, and mills have all the orders they can handle for some time to come. Prices are steady, with discounts as follows: Black Butt-Welded, 52½ %; Galvanized do., 42½ %; Black Lap-Welded, 62½ %; Galvanized do., 52½ %; Boiler Tubes, 60 %.

Nails.—There is no change of any importance, although there is a growing impression that prices are pretty well down to their lowest. Quite a number of mills are shut down, and are likely to remain so unless there is some very marked change in the position. In a general way $2 is quoted from store, but there is no uniformity, so that $1.90 @ $2 is probably about the range, although at some points Nails are quoted at lower prices than these.

Chicago.

Office of *The Iron Age*, 95 and 97 Washington St.,
CHICAGO, October 29, 1888.

A decidely quieter condition of trade is noticed in nearly every branch, and for the first time the influence of the approaching election is felt in a diminished volume of sales and a general disinclination to enter upon new contracts. An exception is noted in such commodities as are always in greatest demand at this season, and which are therefore bought or sold without regard to extraneous influences. Such changes in prices as have come to light during the past week have been almost uniformly downward, but not sufficiently so to excite apprehension of a general break. The dullness of trade has caused occasional concessions from individual manufacturers apparently in need of orders, but the ordinary buyer will find very little change in the quotations made to him.

Pig Iron.—Few entries were recorded in the sales-books of the local dealers during the past week, and if there were any large lots among them, the fact has been carefully concealed. The members of the trade and the Chicago foundrymen, generally, are considerably agitated over a report that the 5000-ton contract for castings for a cable road in Denver, which had been confidently expected to be placed here, has been captured by English manufacturers. The contract is a very important one at this particular juncture, as the Chicago Architectural Works are short of orders, and it would have helped them

nicely in getting through the winter. An uncomfortable feeling prevails, also, in regard to other contracts for castings in which foreign competition may develop. Inquiries are in the market for a considerable quantity of Lake Superior Charcoal Pig Iron, prices of which are reported to be very firmly held. Although an advance in Southern freights of 20¢ per ton is to take effect on the 1st prox., the price of Southern Coke Pig Iron is slightly easier, lower rates being necessary if business is to be taken from Northern furnacemen. Cash quotations are as follows, f.o.b. Chicago: Lake Superior Charcoal, all numbers, $20 @ $21; Alabama Car-Wheel, $26.25; Jackson County Softeners, No. 1, $18 @ $18.50; Hocking Valley Soft Foundry, No. 1, $17.50 @ $18; American Scotch (Blackband), No. 1, 20.50 @ 21.50; other Ohio Soft Irons, No. 1, $17 @ $18; Lake Superior Coke, No. 1, $18 @ $19; No. 2, $17 @ $18; No. 3, $16 @ $17; Southern Coke, No. 1 Foundry, $17.50; No. 2 Foundry and No. 1 Soft, $17; No. 3 Foundry and No. 2 Soft, $16.25; Gray Forge, $15.75.

Bar Iron.—A few car orders are in the market, but there is no business of any magnitude in sight. The demand for small lots is brisk, but buyers usually ask for quicker deliveries than the mills can guarantee, which throws an unusual proportion of this class of trade into the hands of jobbers. About 1.75¢, half extras, f.o.b. Chicago, is the prevailing price for mill lots of Common Iron, with concessions obtainable only on very favorable specifications. Car orders are reported to have been placed at 1.75¢, flat, f.o.b. Chicago. Store prices still range from 1.90¢ to 2¢, according to quantity and quality.

Structural Iron.—Some small orders have been taken, but nothing heavy is to be expected so late in the season. Store prices are as follows: Angles, 2.35¢ @ 2.50¢; Tees, 2.60¢ @ 2.70¢; Beams, 3.80¢. Mill orders are taken at the following rates, f.o.b. Chicago: Angles, 2.20¢ @ 2.25¢; Universal Plates, 2.23¢; Tees, 2.55¢ @ 2.65¢; Beams and Channels, 3.40¢. On combination orders, in which Angles form a part, prices have recently been seriously cut.

Plates, Tubes, &c.—Great activity has characterized this branch of trade, in marked contrast with the condition of business in most other lines. Large orders have been taken for Tank Iron, while boiler-makers have bought very freely from store. The Tank Iron orders were placed at unexpectedly low figures, in view of the prices hitherto quoted by the mills. In every other respect the market has been very firm, and former quotations from store are continued, as follows: Heavy Sheets, Nos. 10 to 14, 2.65¢ @ 2.70¢; Tank Iron, 2.55¢; Tank Steel, 2.80¢; Shell Iron, 3¢; Shell Steel, 3.25¢; Flange Iron and Steel, 4¢; Fire-Box Steel, 4.75¢ @ 5.75¢; Boiler Rivets, 4¢ @ 4.25¢; Ulster Iron, 3.75¢; Boiler Tubes, 60 % off.

Sheet Iron.—Deliveries of Black Sheets are now proceeding in more satisfactory shape, showing that the mills are not so crowded as they were recently. They quote for forward delivery 3¢ @ 3.10¢, at mill, for No. 27, according to time specified. Jobbers are selling freely at 3.20¢ for No. 24, 3.30¢ for Nos. 25 and 26 and 3.40¢ for No. 27, with a concession to best buyers.

Galvanized Iron.—Manufacturers' agents report renewed briskness in the demand last week, keeping them as far as ever from replenishing their warehouse stocks. Prices show no indication of moving upward, but, on the contrary, small lots are now selling at 60 % and 5 % off for Juniata, and 60 % and 10 % off for Charcoal.

Merchant Steel.—Open-Hearth Spring Steel, which has hitherto been held by the association of manufacturers at 2.90¢, has been taken out of their list, and the members of the association are free to make their own prices on it. So far nothing has come up to test values and establish a new quotation. Business is fair in a general way, but no heavy transactions are reported. Association prices are as follows: Bessemer Bars, 2.30¢ @ 2.40¢; Tool Steel, 8½¢ @ 9½¢; Specials, 13¢ @ 25¢; Crucible Spring, 4.40¢; Open-Hearth Machinery, 2.75¢ @ 3¢; Crucible Sheet Steel, 7¢ @ 10¢.

Steel Rails.—Inquiries are increasing for next year's delivery, and some fair-sized lots are wanted for this fall and winter, but so far as can be learned only some small orders were actually placed here during the week. Construction companies are trying to purchase Rails with bonds, notes and all other kinds of paper, but the manufacturers insist upon the cash. New railroad schemes are abundant, and excite renewed hope of better business next year. The makers are still quoting $30 for all deliveries.

Old Rails and Wheels.—No transactions are reported in Old Rails. Holders ask $24, but buyers are well supplied for the present and are not inclined to add to their stock unless the price should recede to about $22.50. Mahoning Valley mills are said to be able to purchase Rails from the East at $24, delivered. For Old Car-Wheels $20 is asked, but no sales have come to light.

Scrap.—Large sales of No. 1 Railroad Scrap have been made during the past week at prices ranging from $20.50 to $21, and Track Scrap at $19.50. The dealers here, as a rule, are not soliciting sales. Lots of 300 to 500 tons have, however, been offered by them at $20, delivered to Chicago mills. Outside dealers are offering large lots at the same price. Notwithstanding the efforts of some of the dealers to work prices up, the feeling is generally in favor of a lower range of values in sympathy with other Old Material and easier prices of Manufactured Iron. Steel Scrap is looking up slightly, owing to inquiries from Pittsburgh mills. Mixed Country Scrap is still quoted at $15. Selling prices of carefully selected Scrap are as follows, ℔ ton of 2000 lb: Horseshoes, $20; Axles, $26.50; No. 1 Mill, $15.50 @ $16.50; Pipes and Tank, $12 @ $13; Light Wrought, $11; Cast Machinery, $15; Stove Plate, $12; Cast Borings, $9.50; Wrought Turnings, $12 @ $12.50; Axle Turnings, $14; Coil and Leaf Steel, $17; Locomotive Tires, $15.50.

Hardware.—The Shelf Hardware trade is as active as ever, but in heavier goods business has been falling off from day to day. This is particularly the case with the country trade, the city demand being, if anything, stronger than it has been. In consequence of the drop in Lead the price of Shot has falled from $1.40 to $1.25, and Solder is now quoted at 15¢ for strictly half-and-half. In Nuts an advance has been made from 5.75 % to 5.40 % off, or 70¢ per keg, for Square. This is due to the reorganization of the combination. No changes worthy of note have occurred in any other line.

Nails.—The current of trade is moving very sluggishly, and reported concessions on factory prices of both Cut and Wire Nails seem to have had very little effect thus far in quickening it. Regular quotations from factory are still $1.90 for Steel and $2.55 for Wire, both f.o.b. Chicago. Small lots are jobbing at $2.10 for Steel ann $2.60 for Wire, but some weakness is manifested in this direction also.

Barb Wire.—The near-by trade is confined to small lots, which are supplied by jobbers at 2.90¢ for Painted, and 3.60¢ @ 3.65¢ for Galvanized. Our advices from merchants in Kansas and other Western States are to the effect that manufacturers are quoting carload lots at 2.75¢ for Painted and 3.35¢ for Galvanized, f.o.b. Chicago.

Pig Lead.—A few hundred tons were sold at rates ranging from 3.80¢ to 4¢, closing at the lower figure. It is reported that no Lead is pressing for sale here, but that transactions have occurred in the customary channels of trade only, no evil effects having followed the Corwith failure.

The charcoal furnace at Appleton, Wis., whose product is sold by Pickands, Brown & Co., 115 Dearborn street, Chicago, was burned on the 28th, the plant being reported completely destroyed. The fire was caused by the Iron breaking through the stack. The furnace would probably have been blown out by the 1st of January for repairs.

Cincinnati.

Office of *The Iron Age*, Fourth and Main Sts.
CINCINNATI, October 29, 1888.

Pig Iron.—The local market for Pig Iron during the past week has been quiet. The only feature of interest has been the report of several sales of round lots of Iron made by a few Southern furnaces at prices a little under those now generally current. The belief is that these stacks had accumulated considerable Iron, which they were very desirous to sell, and the pressure resulted in lower prices. Otherwise prices are fairly well sustained. As a rule the market waits upon the Presidential election; buyers, although they anticipate higher prices, are still inclined to await certainties before contracting more largely ahead. The aggregate volume of business during the week has not been small, but individual sales have been light. There are no new features. General business is not active, and the money market is extremely easy. The following are the approximate quotations for the local market, cash, f.o.b. Cincinnati:

Hot-Blast Foundry.	
Southern Coke, No. 1	$16.50 @ $17.00
Southern Coke, No. 2	15.75 @ 16.00
Southern Coke, No. 3	15.50 @ 15.75
Ohio Soft Stone Coal, No. 1	17.00 @ 17.50
Ohio Soft Stone Coal, No. 2	15.50 @ 16.00
Mahoning and Shenango Valley	17.50 @ 18.50
Hanging Rock Charcoal, No. 1	20.50 @ 22.50
Hanging Rock Charcoal, No. 2	19.50 @ 22.00
Tennessee and Alabama Charcoal, No. 1	18.50 @ 19.50
Tennessee and Alabama Charcoal, No. 2	17.00 @ 18.00
Forge.	
Strong Neutral Coke	14.75 @ 15.00
Mottled Neutral Coke	13.75 @ 14.00
Gray Forge	14.50 @ 14.75
Car-Wheel and Malleable Irons.	
Southern Car-Wheel	20.00 @ 25.00
Hanging Rock, Cold Blast	22.00 @ 25.00
Lake Superior Car-Wheel and Malleable	20.50 @ 21.50

Nails.—There has been a fair movement during the week and the market has ruled steady. Jobbing prices are based upon 12d @ 40d, which sell at $2.10 ℔ keg, with 10¢ rebate in carload lots, at mills. Steel Nails sell at $2.10 and Steel Wire Nails at $2.75 ℔ keg.

Manufactured Iron.—No new features have been developed; there has been a fair trade and a firm tone has prevailed, without change in prices. Common Bar Iron, 1.90¢; Charcoal Bar Iron, 2.90¢ @ 3¢; Sheet Iron, Boiled, Nos. 10 to 27, 2.50¢ @ 3.25¢; Sheet Iron, Charcoal, Nos. 15 to 25, 3½¢ @ 4½¢ ℔ lb.

Old Material.—There has continued to be only a moderate demand for Old Wheels, which are quotable at $19 @ $19.50, spot; Old Rails have ruled steady, with moderate sales at $23, cash, here.

Pittsburgh.

Office of *The Iron Age*, 77 Fourth Ave., {
PITTSBURGH, October 30, 1888. }

While there is scarcely anything heard or thought of just now but politics, there is continued activity in the general Iron and Steel trade. At the Vesuvius Iron Works, of Moorhead, Bro. & Co., the experiment of making gas from coal has been successfully made, and the cost for heating Iron is placed exactly at 60¢ ℔ ton, which is very much cheaper than the present cost of natural gas. Brown, Bonnell & Co., Youngstown, Ohio, have abandoned natural gas and gone back to coal, owing to the scarcity and enhanced cost of the former. There is not much doubt that the manufacture of fuel gas from coal, and possibly from petroleum, will be a success sooner or later, and it is this apprehension, no doubt, that is unfavorably affecting natural gas stocks. When natural gas was first introduced the cost was less than that of coal, but it now costs fully as much and is not so reliable; at times the supply is short, so that for a time a mill may have to shut down. The cost of natural gas to private consumers has in many instances been more than doubled within a year, but not many of them are going back to coal. It is claimed that the price of natural gas was too low, but until the past year or so there were so many companies and so sharp was the competition that it was impossible to advance the rates; now that nearly all other companies have been absorbed up by the Philadelphia company, the price has been pushed up, and this has had very much to do with experimenting on manufactured gas to take the place of natural gas.

Pig Iron.—No particular changes to note in the situation. While the market is quiet, and possibly a little easier, there is no falling off in consumption, which never was much, if any, larger than it is at present. Production is also large, and being increased as additional furnaces are being started, but there is no accumulation of stock, and the market is in a good, healthy condition. As compared with prices of a week ago, there has been no change, with the exception of Bessemer, some sales of which have been made at a decline of 25¢ @ 50¢ per ton. We quote as follows:

Gray Forge Neutral	$15.75 @ $16.50,	cash.
All Ore Mill	16.75 @ 17.25,	"
White and Mottled	15.00 @ 15.50,	"
No. 1 Foundry	18.00 @ 18.50,	"
No. 2 Foundry	17.00 @ 17.50,	"
Charcoal Foundry	21.00 @ 24.00,	"
Charcoal Mill	19.00 @ 20.00,	"
Cold Blast Charcoal	25.00 @ 28.00,	"
Bessemer Iron	17.50 @ 18.00,	"

Standard brands of Neutral Mill selling at $16 @ $16.25, cash, and while furnacemen are refusing to sell Bessemer below $18, cash, consumers have no trouble in getting all they want at $17.50.

Ferro and Spiegel.—Sales of 80 % Ferromanganese, at $56.50 @ $57, cash, and 20 % Spiegel at $28.50, cash.

Muck Bar.—There has been but little new business reported during the past week, but prices remain unchanged at $28.50 @ $29, cash. There does not appear to be as much inquiry as there was some time ago, but so far as we are advised there is no pressure to sell.

Manufactured Iron.—There is nothing new or important to note; while there is not so much new business, mills are nearly all sold ahead and have about all they can do, and this will no doubt be the situation until the close of the present year, when there is usually a lull for a week or two. Prices remain unchanged: Bars, 1.80¢ @ 1.85¢; Plates, 2.20¢ @ 2.25¢; No. 24 Sheet, 2.85¢ @ 2.90¢, all 60 days, 2 % off for cash; Skelp Iron, 1.85¢ @ 1.90¢ for Grooved, and 2.10¢ @ 2.15¢ for Sheared.

Nails.—No change in prices here; full card rates are still being demanded and obtained; but it is said that Wheeling is again cutting 10¢ @ 15¢ ℔ keg below. Wheeling cannot make Nails any cheaper than Pittsburgh, and Pittsburgh manufacturers aver that even at full card rates the margin for profit is small. We continue to quote upon a basis of $1.90 for 12d to 40d, 60 days, 2 % off for cash.

Wrought-Iron Pipe.—Manufacturers report little or no change in the situation as compared with that of a week ago. Possibly there is not quite so much new business, for the mills are busy and are likely to continue so until well toward January. No change in prices. Discounts on Black Butt-Welded Pipe, 52½ %; on Galvanized do., 45 %; on Black Lap-Welded, 62½ %; On Galvanized do., 52½ %; Boiler Tubes, 60 % off regular list; Two-inch Tubing, 13¢ per foot, net; 5⅝-inch Casing, 40¢ per foot, net.

Old Rails.—There have been sales of some 3000 tons reported at $25, cash, including 2000 tons for delivery at Youngstown, Ohio, at price quoted. Some of the railroads have bought new Steel Rails and are putting in Old Iron Rails as part pay; so far as we can learn, there are no American Tees offering below $25.

Steel Rails.—Some round-lot orders have been booked here within the past few days, but terms are strictly private. It is said, however, that sales were made for delivery during the next five or six months as low as $28.50 and even $28.25, cash, delivered on cars in Pittsburgh. It is reported here that the syndicate is not harmonious, and that an early dissolution of the same is not improbable.

Blooms, &c.—Bessemer Steel Blooms and Billets are still quoted at $29 @ 29.50, cash, on cars at makers' works; Nail Slabs, $28.75 @ $29; Domestic Bloom and Crop Ends, $19 @ $19.50. Steel mills are pretty generally busy.

Merchant Steel.—There is a continued good degree of activity, but no recent change in prices. Best Brands of Tool Steel, 8½¢; Crucble Spring Steel, 4½¢; Crucible Machinery, 5¢; Open-Hearth Steel, 2¾¢.

Railway Track Supplies.—Prices remain unchanged. Spikes, 2¢, 30 days, delivered; Splice Bars, 1.80¢ @ 1.85¢; Track Bolts, 2.85¢ with square and 2.95¢ with hexagon Nuts.

Old Material.—There is a fair demand, and prices are steady. No. 1 Wrought Scrap, $21, net ton; Car Axles, $26 @ $27; Cast Scrap, $16, gross; Cast Borings, $12.50 @ $13; Car Wheels, $20.

One of the latest rumors is that Mr. John Walker, who recently withdrew from the firm of Carnegie, Phipps & Co., and James I. Bennett, for many years of the firm of Graff, Bennett & Co., are to form a partnership, and re-enter the Iron business. As yet the rumor lacks confirmation.

Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts., {
CHATTANOOGA, October 29, 1888. }

The past few days has demonstrated the inadequacy of the railroad lines to meet the wants of the shippers. Although the lines have added largely to their rolling stock during the year, they are still far behind the requirements of the country. A prominent railroad official is reported to have said that if 15,000 new cars, with the necessary motive-power, were divided up among the different lines they would all be absorbed at once in moving the freight that is being offered. The money market shows a continued stringency and high rates of discount still prevail. The cotton crop is drawing heavily upon the resources of the banks, and another reason for the scarcity of money is the fact that of the many thousand manufacturing enterprises that have been started throughout the South, a large majority of them have absorbed their capital on the construction of buildings and purchasing machinery, leaving their sources for running expenses dependent upon their bills receivable, which are available only at the banks, or more frequently on the street; even their cash sales more frequently than otherwise run from 30 to 40 days before they are available. Bank rates are from 10 % to 12 %, and outside 12 % to 18 % per annum, on what is considered short-time No. 1 paper.

Pig Iron.—There are hardly any changes in the market worthy of mention. The same condition of affairs continues as reported during the past few weeks. Consumption and demand appear to be about equal with the output. The reinforcement to the supply by the blowing in of new stacks does not appear to be a factor worthy of notice, and the product of those that are still to come will probably be absorbed without causing even a ripple in the general market. It appears to be a matter of surprise to many producers where it all goes to and what is done with it; but, nevertheless, it all goes somewhere, and is utilized for some purpose or other and is all paid for. In reference to price there is no change either way to report. Most of the furnaces have contracted their output for the balance of the year, and many have reached ahead as far as July 1, 1889—mostly on a basis of present prices. At the present writing there are in the Birmingham district 14 stacks blowing and 6 idle; in the Chattanooga district 10 blowing and 2 idle. Most of those that are idle will go in blast within the coming month and four new ones that are nearly completed will probably blow in before the 1st of January next.

Cleveland.

CLEVELAND, October 29, 1888.

Iron Ore.—The total amount of Ore sent down by the different ranges to date is as follows: Marquette Range, 1,543,447 tons; Gogebic Range, 1,100,451 tons; Menominee Range, 926,190 tons; Vermillion Range, 368,385 tons; total shipments to date, 3,938,478 tons. Ore is still coming down at a rapid rate, and there seems little likelihood of any advance in lake freights. The Escanaba rate is now $1.25 ℔ ton, while the freight from Ashland and Two Harbors is but $1.65. This rate is considered very reasonable by both dealers and purchasers and, sales would be much more numerous but for the fact that under the advancing market of a month ago buyers bought quite freely and are now fairly well supplied. This reason, together with the hope that quotations might possibly be lower, has led them to delay further purchases. Dealers are holding the few Ores still in the market at last week's prices. A few scattering sales are reported, but none sufficiently large to furnish material for a correct estimation of the business likely to follow closely upon the heels of the election. The following are the latest quotations, f.o.b. cars lower lake ports:

No. 1 Specular and Magnetic Ores, Bessemer quality	$6.00 @ $6.15
No. 1 Specular and Magnetic Ore, Non-Bessemer quality	5.25 @ 5.50
Red Hematite Ores, Bessemer quality	5.00 @ 5.25
Red Hematite Ores, Non-Bessemer quality	4.20 @ 4.40
Menominee Range Ores, Bessemer quality	5.25 @ 5.50
Menominee Range Ores, Non-Bessemer qality	4.00 @ 4.25
Gogebic Range Ores, Bessemer quality	5.25 @ 5.50

Pig Iron.—A light and yet a fair trade characterizes the local market. The de-

mand is heavier than is usually looked for at this season of the year, and is much better than could reasonably be expected considering the present political excitement. The influences of politics are making themselves felt in the Pig Iron market, and there is little hope for any improvement until after the election. If the results should be favorable to protection, furnacemen, dealers and purchasers look for a better trade. Buyers are already in the market making inquiries for Mill Irons for next season's delivery. Stocks are closely sold up, and very little new Iron can be purchased before January 1, 1889. Following are cash quotations:

Nos. 1 to 6 Lake Superior Charcoal	$20.50 @ $21.50
No. 1 Strong Foundry, Bessemer quality, ₱ ton	18.20 @ 19.00
No. 1 Strong Foundry, ₱ ton	18.00 @ 18.50
No. 2 Strong Foundry, ₱ ton	17.00 @ 17.50
No. 1 American Scotch, ₱ ton	18.25 @ 18.70
No. 2 American Scotch, ₱ ton	17.20 @ 17.70
No. 1 Soft Silvery, ₱ ton	18.50 @ 19.00
Mahoning and Shenango Valley Neutral Mill Irons, ₱ ton	16.00 @ 16.50
Mahoning and Shenango Valley Red Short Mills, ₱ ton	17.00 @ 17.50

Manufactured Iron.—Common Bar is still in excellent demand at 1.70¢, while Sheets of all numbers are scarce and almost unobtainable.

Louisville.

LOUISVILLE, KY., October 29, 1888.

Pig Iron.—There have been few orders placed during the past week, parties not being willing to buy save in small quantities. Prices of Iron have slightly fallen off, but it is thought to be only temporary, and that as soon as the election is over, the market will resume its former activity, and prices will show a slight advance. Three of the new Southern furnaces have recently gone in blast, and are offering Iron on the market. As they find some difficulty in placing their product (which is unknown), save at a slight concession—this fact also leads to unsteadiness. We quote as follows:

Southern Coke, No. 1 Foundry	$16.75 @ $17.75
" No. 2 "	15.75 @ 16.25
" No. 2½ "	15.25 @ 15.75
Hanging Rock Coke, No. 1 Foundry	17.00 @ 17.50
Hanging Rock Charcoal, No. 1 Foundry	20.75 @ 23.00
Southern Charcoal, No. 1 Foundry	17.75 @ 18.25
Silver Gray, different grades	14.25 @ 15.00
Southern Coke, No. 1 Mill, Neutral	14.50 @ 15.00
" No. 2 " "	13.50 @ 14.50
" No. 1 " Cold Short	14.00 @ 14.50
" Charcoal, No. 1 Mill	15.50 @ 16.25
White and Mottled, different grades	13.25 @ 13.50
Southern Car-Wheel, standard brands	22.75 @ 23.75
Southern Car-Wheel, other brands	19.00 @ 21.00
Hanging Rock, Cold Blast	22.00 @ 25.00
Hanging Rock, Warm Blast	19.00 @ 20.00

Detroit.

WILLIAM F. JARVIS & Co., under date of October 29, report as follows: There is little change to note in the condition of the Pig Iron market since our last report, but the volume of business has been a trifle less than the previous week, and no large amount of orders is expected until after election. Furnaces promptly refuse to grant any concessions in their prices even to the most desirable customers. The present outlook for the coming year is certainly a bright one for the manufacturers of Pig Iron, and the majority of furnaces prefer not to name prices except for prompt delivery. Consumers are still urging shipments hurried to them, and there seems to be no falling off in the demand for high numbers of Lake Superior Charcoal. Old Wheels are scarce, and very few sales have been made. Quotations for the present are as follows:

Lake Superior Charcoal, all numbers	$20.00 @ $20.50
Lake Superior Coke, all ore	19.75 @ 20.25
Lake Superior Coke, cinder mixed	18.50 @ 19.00
Standard Ohio Black Band	19.75 @ 20.25
Southern No. 1	17.75 @ 18.25
Southern Gray Forge	16.25 @ 16.75
Southern Silvery	17.00 @ 17.50
Jackson County (Ohio) Silvery	18.50 @ 19.00
Old Wheels	20.50 @ 21.50

New York.

Office of *The Iron Age*, 66 and 68 Duane street, NEW YORK, October 31, 1888.

American Pig.—Lately some sales have been made, at least by one leading Virginia furnace company, for delivery during 1889, at private terms, and some of the Alabama furnaces have similarly placed contracts. We are informed by B. G. Clarke, of the Thomas Iron Company, that he has placed with their customers between 4000 and 5000 tons of Foundry Iron at present prices for next year's delivery. These were, however, exceptional cases. The consumers in question last year suffered from delayed deliveries and turned to other producers this year. Recognizing that they had a just grievance they have been sold Iron at present prices for 1889. We continue to quote Standard to Choice No. 1, $18 @ $19; No. 2 Foundry, $17 @ $17.50, and Gray Forge, nominally, $16 @ $16.50.

Scotch Pig.—The market is very quiet, with prices remaining: Coltness, $21.50, nominally; Shotts, $20.75 @ $21; Langloan, $21, and Dalmellington, $20.25 @ $20.50.

Spiegeleisen.—No business of any consequence is reported. Importers ask $27 for German 20 % Spiegel, $33 for 30 % and $54 @ $54.50 for 80 % Ferromanganese.

Plates.—We quote Iron Tank, 2.1¢ @ 2.2¢; Shell, 2.3¢ @ 2.4¢; Steel Tank, 2.2¢ @ 2.3¢; Shell, 2.4¢ @ 2.5¢; Flange, 2.65¢ @ 2.75¢, and Fire-box, 3.5¢ @ 4¢.

Structural Iron.—We quote Sheared Plates, 2¢ @ 2.1¢; Universal Mill Plates, 2.1¢ @ 2.2¢; Angles, 2.1¢ @ 2.15¢; Tees, 2.5¢ @ 2.6¢, and Channels and Beams, 3.3¢.

Bar Iron.—We quote: Carload lots, half extras, 1.67½¢ @ 1.7¢ for Common; 1.7¢ @ 1.8¢ for Medium, and 1.8¢ @ 1.9¢ for Refined, with prices for fancy brands running up to 2.4¢ @ 2.5¢.

Steel Rails.—The event of the week has been the closing of 21,500 tons of Rails for the Vanderbilt system, including the Lake Shore. A part of the order was taken by an Eastern mill, and a part of it, rumor has it, was secured at a very low price, delivered Buffalo, by the new mill at Pittsburgh. There are quite a number of orders in the market, though some of them may be closed. Among them is the Oregon order already referred to, an order for a transcontinental line, and a 10,000-ton block for a leading Southern road. Some of the prominent Eastern mills are practically out of the market, asking as they do $28 @ $28.50. Their managers apparently prefer to hold back for the present in the hope of better prices later on. Some of the prominent men in the business here do not take a particularly cheerful view of the situation. One of them figured out that no stiffening of prices could be expected until orders aggregating at least 750,000 tons had been placed. This would be ignoring one important factor, the possibility of a marked stiffening of raw material, as the result of an unprecedented quantity of Steel going into other merchant forms than Rails. The latter do not occupy the commanding position as the principal source of consumption of Bessemer Ores, which once they did. Even with a light demand for Rails it might occur that there would be a scarcity of Bessemer Ores. For the present foreign material is out of the question, so that the whole requirements of the country must be met by the comparatively small number of districts supplying low phosphorus Ore in quantity. During the past four months we have already seen the anomalous rise of Bessemer Pig in the face of a declining Rail market. The future might emphasize this tendency. As it is now the market for Rails is unsettled, and a distinctly lower level of prices has been reached. We quote $27.50 @ $28 for standard sections.

Wire Rods.—There is some inquiry, but consumers have low views in the expectation of a decline in the prices abroad through the rupture of the syndicate. Against the probability of lower prices, importers urge that the price of Rods depends upon that of Billets. The latter are stiff, and are considerably higher than they were when Rods went down to $36, as they did at one time. Then the sales were made to clear away accumulated stocks. Besides, freights are high, steamer being 10/ and sailer 5/ @ 7/, plus 2½ @ 3 % insurance. These facts, it is urged, preclude any material decline in foreign Rods. The offerings of Acid Bessemer Rods on a sterling basis, against banker's credits, are said to be very deceptive. The sellers may assert that they may cost the buyers a given price, but they are far from offering to sell them at that price. Calculation of the sterling price, it is insisted, will show that they would ultimately cost the buyer considerably more. We quote $39 @ $39.50 for foreign Basic Wire Rods.

Old Rails.—Among the recent transactions, not yet reported, is the sale of one lot of 3000 tons of Old Rails from a North Carolina road to a Virginia mill at $24, delivered, the Old Rails having been given in part payment to an Eastern Rail mill for new Rails purchased. This week we note sales aggregating 7000 tons of American Old Rails to a Western mill, the stock not having come from this section, however. Small lots are occasionally offered here at $23 for Tee's, but for any larger amounts about $23.50 would have to be paid, with considerable of the supply here held at higher figures.

Metal Market.

Copper.—In the London market spot Chili Bars declined from £78. 10/ to £78; futures from £79 to £78. 10/ and good merchantable brands from £78. 2/6 to £78, total sales not exceeding 500 tons for the week. Here nothing was done outside of the syndicate's dealings, the nominal quotation for Lake being 17½¢, and for casting brands 16½¢. The domestic export of Ingot Copper during the first eight months has been 25,874,724 lb, against 9,019,516 in 1887. The import of American Copper into Liverpool and Swansea from January 1 to October 15 has been 19,767 tons Fine, against 9982 last year.

Tin.—There has been a decline in the London market during the week from £103 for spot to £102, and futures from £103. 12/6 to £102. 15/; sales 370 tons. In our own market nothing transpired beyond the sale of 10 tons spot at 23½¢, the closing price being 23¢, while November and December range between 22.75¢ and 22.95¢. The net import into the United States during the first eight months has been 21,433,637 lb, against 19,460,306 lb last year. The shipments from the Straits Settlements to the United States during the first eight months were 22,289 piculs, against 59,481 last year; 52,817 in 1886; 20,252 in 1885; 41,857 in 1884, and 78,739 in 1883. It is noted from Singapore that in November and December the average shipments from the Straits to all quarters will be at least 2000 tons ₱ month. The jobbing demand at New York is meanwhile slack; at ruling prices consumers only buy when they are compelled to do so. *Tin Plates.*—The demand has been moderate, business quiet, stocks are reduced and prices are unaltered. Liverpool quotes Coke at 13/6. We quote at the close to-day, large lines, on the spot,

Siemens-Martin Steel, Charcoal finish, $5 @ $5.75; Coke finish, $4.70; Ternes, $4.20 @ $4.35; Bessemer Cokes, $4.45 @ $4.50, and Wasters, $4.25. Net import into this country during the first eight months, 454,445,062 lb, against 430,218,960 in 1887.

Lead.—Outside of the Metal Exchange, where, during the week, only 164 tons were sold, the sales amounted to about 1000 tons at 3⅛¢ @ 3¾¢, closing at 3.70¢ @ 3.80¢. Everything remains in confusion, pending a clearer insight into Corwith & Co.'s winding up settlements, and consumers do not feel disposed to do anything to speak of till after the elections. At St. Louis the price is 3½¢. In London Soft Spanish gave way from £13. 15/ to £13. 5/.

Spelter.—At the West Ore has improved from $30 ℔ ton to $31, and is scarce at that, while the output will decrease when the cold weather sets in. The demand here is moderate, and supplied at 5¼¢ from second hands, but it cannot be sold without loss by smelters for less than 5¼¢, at which Common Domestic is held, and Silesian at 6¢.

Antimony.—Hallett has continued selling moderately at 10¼¢, and Cookson at 12½¢ @ 12¾¢.

New York Metal Exchange.

The following sales are reported:

THURSDAY, October 25.
(Under the rule.)

109 tons Lead, spot..... 3.82½¢
64 tons Lead, October..... 3.85¢
(Seller's right to double.)

FRIDAY, October 26.

16 tons Tin, November..... 3.80¢
100 tons Lead, October..... 3.80¢

SATURDAY, October 27.

32 tons Lead, December..... 3.70¢

MONDAY, October 29.

16 tons Lead, spot..... 3.65¢

TUESDAY, October 30.

10 tons Tin, spot..... 23.00¢

Financial.

The Presidential year 1888 is no exception to the rule that dullness in business is characteristic of the few days that immediately precede the casting of the vote. Nevertheless, in most lines there is a fair degree of activity, and indications generally are unusually favorable. The marketing of the crops is in larger volume as the season advances and the traffic returns from the various lines of transportation indicate a movement largely in excess of the corresponding date last year. The approach to the closing of navigation, as well as the movement of the corn crop, encourages the view that before long rates will be established upon a more stable basis. The one disquieting feature is the small volume of exports. The aggregate returns of leading clearing houses are also larger in comparison. There is certainly no retrograde movement. It is to be observed, further, that those points recognized as peculiarly industrious, such as Pittsburgh, Detroit, Cleveland, Philadelphia, Worcester and Lowell, all report substantial gains. Local reports refer to a fair trade among dry goods jobbers. In groceries the South is among the heaviest buyers in the market just now, and collections from that section are said to be unusually good. One of the leading houses reports that collections even in Florida, outside the yellow fever districts, are better than before for many years. Coffee is about the weakest on the list, sugar is slack, and other goods somewhat nominal in the absence of business. The position of breadstuffs is more confident, but speculation is still active and actual transactions are unimportant. Corn is offered freely at a decline. Cotton spot stock is steady, with a better demand. Provisions are controlled from Chicago—spot and future stuff for export as dull as ever. The Florida orange crop, just coming to hand, is pronounced the largest ever known and in fine condition. The President has appointed Spencer B. Newbury and Rush C. Hawkins, of New York, to be assistants to the United States Commissioner General to the Paris Exposition.

Stocks were well supported early in the week, partly on buying orders from London, but toward the close prices were weaker, with few exceptions, in consequence of losses from railroad operations, particularly among Eastern roads, although at one time Reading led in the decline, being affected by the unfavorable financial statement. It was considered likely that the complaints to the Interstate Commerce Commission against the Lehigh Valley for discrimination were responsible for some selling of the coalers. The Terminal group again on Saturday lost fractionally on the current talk of legal difficulties attending the lease of the East Tennessee to the Danville and the sale of Georgia Central to Terminal. On Monday bears gave special attention to the coalers, following up their previous sales of Reading with further selling of both that stock and Lackawanna. The suits of Coxe Bros. & Co. accounted, it was said, for these sales in large measure, as the decision in the cases may have some bearing upon the business of other Coal roads than the Lehigh Valley, the one directly interested. On Tuesday there was a vigorous raid upon New England, Reading and the grangers, which had an unsettling effect upon the whole list, but the tone was stronger at the close.

Government bonds were steady and unchanged, as follows:

U. S. 4½s, 1891, registered..... 108⅜
U. S. 4½s, 1891, coupon..... 108⅜
U. S. 4s, 1907, registered..... 127½
U. S. 4s, 1907, coupon..... 127½
U. S. currency 6s..... 121½

Up to date the Government has purchased under the April circular $51,392,000 4s and $38,355,350 4½s. The 4s have cost $66,005,539 and the 4½s $41,366,634, and the saving to the Government in anticipating their redemption before maturity is about $26,500,000.

Foreign exchange was firmer, with posted rates $4.84½ @ $4.88½. Although the exports from New York for September were smaller than for any previous September for 12 years, the foreign commerce of the country as a whole is shown by the monthly report from Washington to have been more favorable than was expected. The total exports for the month were $54,112,117 and the imports $56,691,490. For the same month last year we exported nearly $3,500,000 more in produce and manufactures and imported $2,000,000 more of foreign merchandise. But for September of this year we have imported $13,000,000 less of gold and silver, and have exported nearly $1,000,000 more of coin and gold bars, which accounts for the fact that the outgoing volume nearly balances the incoming tide. The following is a comparison of the returns from January 1 in each of the last three years:

	1886.	1887.	1888.
Total exports.	$545,639,205	$517,623,960	$495,845,741
Total imports.	525,023,023	576,108,528	561,264,536
Excess of imports		$58,484,568	$65,418,795
Excess of exports	$20,616,182		

For the first nine months of 1885 the excess of exports was $52,746,789, making a difference between this year and that of $118,165,584, which is accepted as quite sufficient to account for the prevailing depression in business. At the same time the present condition of the market for foreign exchange is pointed at as evidence that the large balance has been settled by the exports of American securities. Respecting the present case in London, monetary writers there describe the situation as factitious, as future heavy calls for gold are looked for from Russia and the Argentine Republic.

The weekly bank statement shows a decrease of $1,200,000 in surplus reserve, which now stands at $15,698,400, against $11,926,000 last year, and $6,398,000 in the last week of October, 1886. In loans there was a slight contraction. In other respects there were no important changes. The call for currency continued heavy in the South. Time loans are easier, being quoted at 3½ % for 60 days and 4 % for four to six months. The best single name commercial paper sells at 5½ @ 6½ %, and fair indorsed at 4½ %. There is a fair demand for paper, and the supply limited.

The total clearings of 38 cities last week show an increase, compared with last year, of 7.2 %; outside of New York, 10.5 %. New York increased 5.4 %; Boston, 21.8 %; Philadelphia, 17.7 %; Chicago, 6 %; St. Louis, 6.4 %; Pittsburgh, 12.5 %; New Orleans, 4.2 %; Kansas City, 20.9 %; Milwaukee, 8.2 %; Minneapolis, 3.7 %; Omaha, 26.2 %; Denver, 14.4 %; Detroit, 34.2 %; Cleveland, 10.3 %; Memphis, 10.4 %; Hartford, 11.6 %; Peoria, 23.9 %; Grand Rapids, 18.3 %; Topeka, 14.1 %; Baltimore, decrease, 1.9 %; San Francisco, 12.2 %; St. Paul, 10.02 %; Galveston, 9.1 %; Indianapolis, 11.2 %; Columbus, 4.9 %; Wichita, 15.8 %; Duluth, 30.9 %; Norfolk, 9.7 %, and St. Joseph, 25.8 %.

The exports of specie from this port during the week amounted to $969,000 and the imports to $98,000. Since January 1 the amounts respectively are $30,842,000 and $6,396,000, against $14,597,000 and $37,765,000 in 1887. It is announced that a strong New York syndicate, including many influential capitalists, have bought a very large interest—about $1,000,000—in the company owning the city of Annistown, in Alabama. The organizer of the syndicate is William Henry Woods.

The importations of merchandise at this port during the week were valued at $9,100,000, of which $2,000,000 represent dry goods. Since January 1 the total is $385,840,712, as compared with $390,470,937 for the same time last year. The exports were $6,512,317; not a bushel of wheat was included, yet speculators are indifferent. Some 15,000 sacks flour were bought by English shippers—the first in a long time.

The St. Louis National Bank, which has been a United States depository for 20 years, will close its Government accounts, the business being no longer profitable.

Coal Market.

The Anthracite Coal trade is comparatively dull, although a fair amount of business is in progress. In the face of a continued large production at the mines and a lessened demand, prices have a softening tendency. Stove is the only size not in excess, and in consequence the full circular is not insisted upon as rigidly as a short time ago. It is announced that there will be no advance in November. Red Ash is scarce. The one marked feature is the enormous output for the week, aggregating 886,469 tons. This is a decrease of 82,000 tons compared with the previous week, but the amount is fully up to the average since the commencement of the active season, and is 139,000 tons larger than for the corresponding week last year. Since January 1 the total is 31,206,000, as compared with 28,287,000 tons for the corresponding period in 1887. The output from the Schuylkill region is the same as for the previous week, but the Lehigh reports 31,000 tons less and the Wyo-

ming 52,000 tons less. The Lackawanna, it is said, has reduced the working time. Quotations are unchanged—viz: Hard White Ash, Lump, $4.50; Broken, $4.15; Egg, $4.40; Stove, $4.65; Chestnut, $4.55; Free-Burning, f.o.b., Broken, $3.95; Egg, $4.30; Stove, $4.65; Chestnut, $4.65; Pea, $2.75.

The interest of the trade for the time being is concentrated on the case of Coxe Bros. & Co., now before the Interstate Commerce Commission. This firm of individual colliers, whose shipments amount to 1,500,000 tons per annum, last week filed with the Commission, at Washington, a complaint against the Lehigh Valley Railroad alleging that the road discriminates against the firm of Coxe Bros. & Co., and other shippers in favor of the Lehigh Valley Coal Company. The complaint avers that the Lehigh Valley Company is a producer of both Anthracite and Bituminous Coal, and carries Bituminous at about one-half of the rates per ton per mile charged on Anthracite; that much of the Bituminous comes in competition with certain sizes of Anthracite (Pea, Buckwheat, &c.), and that in consequence of a discrimination in favor of the Lehigh Valley Coal Company, Coxe Brothers & Co. are obliged to dump on the banks a large quantity of these sizes and allow it to go to waste. The complaint also charges that the Lehigh Valley Railroad Company, being the owner of the Lehigh Valley Coal Company, sells Coal in New York Harbor at prices below the sum of the current price for Anthracite at the mines, and the charges for transportation paid by other producers, and that in consequence of this discrimination in favor of the Lehigh Valley Coal Company that concern has been enabled to secure large contracts for delivery in New York Harbor, which were entirely out of the reach of competition by Coxe Brothers & Co. and other shippers. One of the contracts referred to is that of supplying the Manhattan Elevated Railway Company, and it is alleged that, although President Sloan, of the Delaware, Lackawanna and Western Railroad, is a director of the Manhattan Company, he is unable to compete with the Lehigh Valley for the benefit of his own road.

It is reported that a syndicate is preparing to take charge of and to expose a great coal vein along the line of the Texas Pacific. At the head of this syndicate is Col. R. D. Hunter, of St. Louis, associated with capitalists in New York and Texas, who purchased mines on the Texas Pacific, 80 miles west of Fort Worth, including 23,000 acres of Coal land. The Coal is of the bituminous variety. The company is known as the Texas Pacific Coal Company, capital, $2,000,000.

Bituminous Coal is active, and the supplies are scarcely equal to the demand. Pool prices remain unchanged. Cumberland reports for the week 72,000 tons and Clearfield 58,000 tons. Shipments in either case are some 200,000 tons in excess of last year's product up to October 20.

British Iron and Metal Markets.

[*Special Cable Dispatch to The Iron Age.*]

LONDON, WEDNESDAY, Oct. 31, 1888.

The report has circulation that a movement is under way for an anti-syndicate "deal" in Copper, the aim of which is to transfer the control of the market from the French speculators to England and thereby overcome the existing feeling of insecurity. The impression derived from the meager information imparted is that the "deal" is practically a combination of English and American companies. In apparently well-informed quarters it is stated that indications are very promising for the consummation of the project and the elimination of the purely speculative interest, but as to the date the proposed combination would go into force, and regarding the result upon existing contracts with the French syndicate, no satisfactory information is given. Speculation in both Chili Bars and G. M. B. Copper has been very quiet again, and consumers are still indifferent buyers, not only of Bars, but of furnace material.

The week's operations in Block Tin have been large (the best part of 1000 tons, all told), but the market showed less spirit the last few days. The position continues to favor a strong market, and the Batavia sale of Billiton, realizing as it did £2 above European quotations, served to infuse more or less tone. Offerings, however, have been liberal enough in the local market to operate against a rise, and to-day's prices are the lowest of the week.

There has been no radical change in the Tin-Plate market. The demand continues fairly active, but buyers and sellers are still apart on prices, and new contracts are thereby restricted. Makers have the books full for the next 30 days and are turning out about 125,000 boxes per week. Prices are maintained on prompt deliveries, but irregular on futures. The labor difficulty at the Margam works has been settled and the mills are in full operation.

Pig Iron has been in more active demand for consumption, and this, together with the fact that five furnaces have been damped, thereby reducing the supply considerably, gives the market a stronger tone. Activity is still reported from the Steel works in nearly all sections, and manufacturers have orders booked that will keep them busy the balance of the year. In some cases new orders are being refused. Additional Steel plant is being erected in several localities.

The market for Old Iron Rails has continued slow, and holders, who have been expecting large American orders, express disappointment. Prices for these and for Old Material generally are nominal in a great measure, owing to the moderate trade passing. Offers of Old Rails have been made at lower prices.

Scotch Pig—Apart from 1/6 decline on Summerlee there has been but slight variation in prices. Business has been fair as a whole.

No. 1 Coltness,	f.o.b.	Glasgow	49/6
No. 1 Summerlee,	"	"	49/6
No. 1 Gartsherrie,	"	"	47/6
No. 1 Langloan,	"	"	49/
No. 1 Carnbroe,	"	"	43/
No. 1 Shotts,	"	at Leith	49/
No. 1 Glengarnock,	"	Ardrossan	47/6
No. 1 Dalmellington,	"	"	42/6
No. 1 Eglinton,	"	"	41/6

Steamer freights, Glasgow to New York, 6/6 Liverpool to New York, 10/.

Cleveland Pig.—The market has shown little change, demand running fair and prices ruling steady. No. 1 Middlesboro', G.M.B., 37/; No. 3 do., 34/6.

Bessemer Pig.—There continues to be an active business in this branch and prices are very firm. West Coast brands, mixed numbers, 45/3, f.o.b. shipping point.

Spiegeleisen.—The demand continues fairly active and prices remain firm. English 20% quoted 80/, f.o.b. N. W. England shipping point.

Steel Rails.—There is still a large business. Prices are variable, but the market quite strong in tone. Standard English sections quoted at £3. 18/9 @ £4, f.o.b. at N. W. England shipping point.

Steel Blooms.—Demand has been slow, and transactions are reported at slightly lower prices. We quote £3. 18/9 for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—In these there is still an active trade, and prices remain very firm. Bessemer, 2½ x 2½ inch, £4. 2/6, f.o.b. at N. W. England shipping point.

Steel Slabs.—The demand continues moderate, and makers have accepted lower prices. Bessemer, £3. 18/9, f.o.b. at N. W. England shipping point.

Steel Wire Rods.—A quiet market, and holders naming former prices. Mild Steel No. 6 quoted at £5. 19/3 @ £6 and No. 5 at £5. 18/6, f.o.b. at N. W. England shipping point.

Scrap Iron.—Demand continues moderate and former prices prevail. Heavy Wrought quoted at £2. 2/6 @ £2. 5/, f.o.b.

Old Rails.—The demand has continued slow and prices are still rather weak. Tees quoted at £3 and Double Heads £3. 3/9, c.i.f. New York.

Crop Ends.—Moderate sales only, and former prices current. Bessemer quoted £2. 7/6 @ £2. 10/, f.o.b.

Tin Plate.—The situation is about the same as last week, buyers and sellers being considerably apart. We quote, f.o.b. Liverpool:

IC Charcoal, Allaway grade	15/3 @ 15/9
IC Bessemer steel, Coke finish	14/ @ 14/3
IC Siemens " " "	14/3 @ 14/6
IC Coke, B. V. grade	13/6 @ 13/9
Charcoal Terne, Dean grade	12/ @ 12/6

Manufactured Iron.—Continued activity is reported in all departments and prices are strong throughout. We quote, f.o.b. Liverpool:

	£	s.	d.		£	s.	d.
Staff. Ord. Marked Bars.	....			@	8	2	6
" Common "	....			@	5	7	6
Staff. Bl'k Sheet, singles	....			@	7	10	0
Welsh Bars (f.o.b. Wales)	4	17	6	@	5	0	0

Tin.—The volume of business has been large, but prices have varied to a moderate extent only. Straits quoted at £102 @ £102. 10/, spot, and £102. 15/ @ £103 for three months' futures.

Copper.—The market quiet, and prices without material change. Chili Bars, £78, spot, and £78. 10/, three months' futures. Best Selected, £81. 10/.

Lead.—Prices have been irregular and the market is still unsettled. Soft Spanish, £13. 7/6.

Spelter.—A moderate business in this metal and prices without material change. Silesian, ordinary, £18. 17/6.

Slag Paving Stones.—For some time past a number of slag paving stones have been undergoing a severe test under the heavy traffic of Broadway at the corner of Reade street. These paving blocks were made at Catasauqua, Pa., under the patents of Martin V. B. Steinmetz, of 115 Broadway. The cinder as it flows from the blast furnace is run with a ladle from which it is poured into a series of molds placed on an endless conveyer which carries them to air-tight annealing ovens in which they are allowed to cool gradually. Tests of the blocks made by the Department of of Public Works showed crushing strength of 9,674, 12,161, 12,100 and 11,806 pounds respectively in four different samples.

The inventor claims that he can produce these paving blocks at about 1 cent a piece, while granite blocks cost from 7 to 8 cents a piece. While the latter polish under heavy traffic, the slag blocks wear rough. The cost of the plant is relatively small.

Foreign Markets.

EQUIVALENTS.

	Cents.
Franc, Peseta or Lira	19.3
Florin (Netherlands)	40.2
Florin (Austria)	35.9
Milreis (Portugal)	$1.08.
Milreis (Brazil)	54.6
Mark (Germany)	23.8
	Pounds.
Kilogram	2.205
Picul	134.

WEST INDIES.

PORT OF SPAIN, TRINIDAD, September 28, 1888.—*Asphaltum.*—A brisk export demand has prevailed at $14.04 ℔ ton f.o.b., including the export duty for boiled, and $6.84 crude. There have been exported from the island, so far this year, 41,372 tons, as compared with 32,681 last year, and 30,450 in 1886. *Exchange*, 90 days' sight, on London, $4.80 @ $4.86.—*E. P. Masson.*

BRAZIL.

PARA, October 26, 1888.—*India Rubber.*—There is for the moment hardly any unsold stock on hand.—*Per cable direct.*

EAST INDIES.

COLOMBO, CEYLON, September 20, 1888.—*Plumbago.*—Our market has weakened somewhat; we quote at the close Large Lumps, in rupees ℔ ton, 145 @ 170; Ordinary Lumps, 125 @ 160; Chips, 80 @ 95, and Dust, 40 @ 65. Shipments since October 1 have been as follows: To England, 74,042 cwt.; to Marseilles, 38; to Trieste, 532; to Hamburg, 12,594; to Antwerp, 6243; to Bremen, 2012; to India, 82, and to the United States, 140,469, together 236,003, against last year, 281,158; in 1886: 188,647, and in 1885: 192,192 cwt. *Coir Yarn*, Nos. 1 to 4 ℔ cwt., 7 @ 12 rupees. *Ebony.*—Some sales have been effected at 85.50 rupees ℔ ton. *Exchange*, six months' sight, on London, 1/5 3-32.—*Volkart Brothers, represented by Mr. John W. Greene, 82 Wall street, New York.*

MANILA, October 22, 1888.—*Hemp*—Has been inactive and may be quoted nominally $11 ℔ picul, against $9.50 same date last year, equaling ℔ ton, cost and freight, £37. 7/6, against £33. 17/6. Clearances for the United States since last cable, 9000 bales, against 12,000 same time last year; since January 1, 172,000, against 190,000; loading for ditto, 53,000, against 45,000. Cleared for England since January 1, 283,000 bales, against 183,000; loading for ditto, 2000, against none. Cleared for other countries, 59,000, against 34,000. Receipts at all ports since last cable, 9000, against 27,000; ditto since January 1, 515,000 bales, against 431,000 in 1887 and 329,000 in 1886. *Freight*, $6, against $5.50; *Exchange*, six months' sight, 3/6¾, against 3/8¼.—*Ker & Co. to Mr. Charles Nordhaus, their agent, 89 Water street, New York, per cable direct.*

PENANG, September 19, 1888.—*Tin.*—During the fortnight the receipts amounted to 14,500 piculs, of which Europeans bought 8500 and Chinese 6000. The market, under the influence of London cable fluctuations, improved from $35.90 ℔ picul to $38.85, receded to $36.90, and winds up at $37.35, at which latter figure Chinamen bought. Previously Europeans purchased at $38 and Chinese at $38.30.—*Schmidt, Kustermann & Co.*

SPAIN

BILBAO, October 13, 1888.—*Metals.*—As per official returns shipments of Ores and Metals from Spain during the first seven months were as follows:

	1886. Tons.	1887. Tons.	1888. Tons.
Calamine	18,675	19,849	19,770
Pyrites	416,931	470,230	494,348
Iron Ore	2,566,609	3,159,987	2,743,582
Pig Iron	35,655	72,774	41,640
Precipitate	15,718	16,409	15,745
Quicksilver	519	1,105	865
Pig Lead	62,565	77,037	73,092
Totals	3,116,672	3,817,391	3,389,042

The foregoing table shows that with the exception of Pyrites there has so far been a decrease in every item. *Iron Ore* in our own market remains in good position; it would be more active still but for the scarcity of steamers, which keeps some crops idle. We quote: Rubios, 7/ @ 7/3, and Campanil, 8/ @ 8/3. Shipments thence so far, 2,966,883 tons, against 3,476,257 tons last year. Of *Pig Iron* 2100 tons went to Italy this week and 340 tons were shipped coastwise. The Barcelona International Exhibition proves such a success that it is to last till December 31.—*Bilbao Maritimo y Comercial.*

AUSTRALIA.

MELBOURNE, Oct. 4, 1888.—*Iron.*—Importers have tried to raise prices, but so far in vain; the market is well sustained and the tendency rather upward than downward. We quote today: Galvanized Iron, £17. 10/; Fence Wire, £9. 10/, and Iron, £6. 15/. Fortnight's *Tin* shipments were 375 tons from the mainland and Tasmania.—*Per cable from Europe.*

GERMANY.

HAMBURG, October 20, 1888.—*Iron.*—The position of Pig Iron has gradually improved inasmuch as in spite of a slightly increased production stocks decreased 400 tons in August, while in July they had increased 11,000 tons in Rhenish-Westphalia. The orders received for Spiegel partially extend into the first quarter of 1889; the quotation remains steady, 53 marks ℔ ton for 12 % Manganese. This barely covers cost of production; a good demand continues to prevail. Forge Pig has also been in better request, but at not very remunerative rates, Siegen selling good quality at 47 @ 48 marks ℔ ton, but syndicate clings to 50 marks. Foundry Pig has been raised 2 marks ℔ ton in consequence of the extraordinary demand for the same. Bessemer Pig has been raised 1 mark. The quotation for Luxembourg White is 37.15 marks; for Gray, 42.40; English Bessemer has declined 2/ @ 44/6 for mixed lots on the West Coast. Merchant Iron has been in diminished demand. Beams are as lively as ever; Hoop Iron is a little more so, yet it sells very low. The inquiry for Boiler Plates, instead of abating, on the contrary is even more pressing and general. Thin Sheets have been looking up slightly too. There are indications of an impending revival in the Wire branch generally. Machine shops and foundries continue doing well, so much so that the latter are about to raise their prices. Car works are very busy. The quotations are as follows at the works: Merchant Iron, 125 @ 127.50; Boiler Plates, 170; Tank Sheets, 150; Steel Sheets, 160; Car Wheels, 315; Loose Axles, 230; Hoops, Steel, 215 @ 230; Steel Rails, 115. Prospects for the renewal of the International Steel Rail Syndicate are even worse now than before. Advices from Upper Silesia in every branch of the Iron trade remain of the most encouraging kind. *Metals.*—Lead is firm in this city, and both Copper and Spelter are steady.—*Borsenhalle.*

Legal Decisions

CARRIER AS WAREHOUSEMAN.

T. forwarded tin by a carrier, and the bill of lading provided that the carrier should not be liable for loss by pirates, robbers, thieves, &c., whether such perils or things arise from the negligence, default, or error of judgment of the pilot, master, mariners, engineers, stevedores, agents, or other persons in the service of the shipowner, and occur before, during the voyage, or at the port of discharge. The ship arrived on the 25th of November, and notice of arrival was given the consigners the same day; the goods were discharged on the 27th of November, but were not removed from the wharf until November 29, when it was discovered that a large part of the tin had been stolen. The wharf was the private wharf of the carrier, and it did not permit any removal of goods unless a receipt was given. In this case, however, no receipt was given. T. sued for his loss, and the trial court decided 1, that the carrier was liable as a carrier; 2, and, if not, it was liable as a warehouseman. The case—Tarbell *vs.* Royal Exchange Shipping Company, Limited—was carried, after a reversal by the general term, to the Court of Appeals of New York, where the plaintiff finally succeeded. Judge Andrews, in the opinion, said: "1. The company had ceased to be a carrier, as they had given notice of arrival, had discharged the goods, and there was sufficient time to remove them. 2. The tin was taken away from the wharf through the negligence of the carrier, who then was a warehouseman, and this negligence was so gross that it was liable for the loss. 3. The exemption of the carrier from loss by theft cannot be made available to relieve the carrier when he becomes a warehouseman."

INTEREST.

A promissory note provided for "interest from this date (date of the note) at the rate of 8 per cent. per annum, payable as per five interest notes hereto attached." The note was sued upon, and it was claimed that this declared rate of interest, 8 per cent., should be continued even after the maturity of the note. The legal rate of interest was 7 per cent., and the court would not allow more than that rate from the maturity of the note. In this case—Sherwood *vs.* Moore—on the appeal to the United States Circuit Court, Northern District of Georgia, the judgment below was affirmed. Judge Newman, in the opinion, said: "It may be considered as settled, I think, in the Federal courts, controlled as they are by the decisions of the Supreme Court of the United States, that if a conventional rate of interest higher than the ordinary legal rate is stated in a promissory note, such higher rate will not be allowed beyond the maturity of the paper, unless the terms of the instrument itself extend it beyond maturity. There is a qualification, however, to this ruling by the Supreme Court—namely, that the local law of the State will control—and it is claimed here by plaintiff's counsel that a different rule has been established in Georgia. I do not construe the decisions of this State as he does on this question, and am of the opinion that only the legal rate of interest can be allowed here. The presumption of the law was that this note would be paid at maturity. Such must be held to have been the expectation of the parties. An implication will not arise when, in the absence of evidence, it must be based upon a presumption which does not exist. A contract to pay a higher rate of interest than the ordinary legal rate will not be extended beyond its term. If it is desired that the indebtedness shall bear such higher rate of interest beyond maturity, the contract should provide for it. In my opinion, in this case interest at the rate of 8 per cent. per annum ceased at the maturity of the note, and judgment must be entered for interest at the rate of 7 per cent., the legal rate, from the maturity of the note."

A gang of men were repairing the iron truss bridge which spans the Big Muddy River, in Illinois, on Tuesday, and an order was given to loosen a girder, one of the main supports. One turn of the wrench swung the bridge out of plumb, and the vast mass dropped to the water, 50 feet below. The bridge was the largest one of the kind in the State—170 feet in the clear.

Alex. Laughlin & Co., engineers and contractors, Wade Building, Cleveland, Ohio, have opened a branch office at Knoxville, Tenn., under the management of Evan Jones.

The Nordyke & Marmon Company, of Indianapolis, Ind., are filling an order for a small flour mill, ordered by an Englishman. It is to be located at the gold fields near Natal, South Africa. It will be driven by a large American windmill, that being the only available power in that far-away clime, and will be shipped via New York, Liverpool and Cape Horn to Natal, and then by wagon for about 200 miles to destination.

Hardware.

During the past week there has been a perceptible diminution in the volume of business, which is owing in good part to the fact that it is the closing week of the month, as well as to the increased attention which is being given to politics. In trade matters there is little new or important to record, though some changes in price have been made, and others of importance are being considered. The condition throughout the country is regarded as very satisfactory.

Cut Nails.

The New York market in Cut Nails is very quiet, few sales of any consequence being made, the basis remaining $1.80 @ $1.90 for carload lots on dock, and $1.90 @ $2.00 in small lots from store. Considering the fact that Nails would not net more than $1.65 @ $1.70 at Wheeling for sales over the greater territory east of the Allegheny Mountains, Eastern manufacturers attach little importance to possible threats of invasion. We understand that the consummation of the Western Cut Nail Association is dependent upon the consent of one manufacturer, who has just returned from Europe.

Barb Wire.

The market in this city is affected, in sympathy with the low prices and weak tone of the Western market, and prices are slightly lower. As a general quotation for Four-Point Galvanized, 3.55 cents to 3.6 cents may be named, with concessions for carload lots. Reports from the West indicate that low quotations on Barb Wire are being made, 3.35 cents for Galvanized and 2.75 cents for Painted being named on car lots. Staples, plain, are quoted at as low as 2.70 cents, and Galvanized at 3.30 to 3.35 cents, free on board cars at factory. It is to be observed that the usual difference between Painted and Galvanized Wire is not in all cases observed, and that Staples are also offered at low prices.

Miscellaneous Prices.

J. F. Wollensak, Chicago, Ill., makes the following quotations on his Transom Lifters and other goods:

Transom Lifters.	Discount.
Bronzed Iron, class 3 and 4	50 %
Bronze Metal, class 3 and 4	25 %
Brass, class 3 and 4	35 %
Crown and Star	50 %
Eagle and Shield	50 %
Skylight Lifters	35 %
Sash Centers	50 & 10 %
Letter Boxes	25 & 10 %
Tinned Malleable Iron Door Keys	50 & 10 %

The following are revised prices of tools manufactured by W. G. Avery Mfg. Company, Cleveland, Ohio:

	Discount.
Saw-Set and Punch	30 & 5 %
Revolving Punch	30 & 10 %
Bevel and Square	30 & 10 %
Bevel Protractor	30 %

Jewett & Leonard, Grafton, Mass., manufacture the Champion Horse and Cattle Cleaner in two styles, one of which has a scalloped edge and is designed for long-haired heavy-coated horses. The other has a smooth edge for sensitive or clipped horses. These Cleaners are sold to the retail trade at $2.75 per dozen.

The Moore Mfg. and Foundry Company, Milwaukee, Wis., issue under date November 1, the following discount sheet: Terms, 60 days or 3 per cent. discount for cash in 10 days, goods f.o.b Milwaukee or Chicago:

	Discount.
"Acme" Barn-Door Rollers	55 %
Baggage Car-Door Hangers	33⅓ %
Brackets, for Rail	25 %
Carriers, for Hand Hoists	20 %
Ceiling or End Pulleys	40 %
Chain, Long Haul	25 %
"Climax" Barn-Door Hangers	55 %
"Climax" Barn-Door Hangers, Wood Track	55 %
Differential Pulley Blocks	40 %
Dumb Waiter Pulleys	50 %
Hay Fork Pulleys	40 %
Hooks, Floor	40 %
Hand Hoists	20 %
Hand Hoists, Stationary	20 %
Log Binders	25 %
"Novelty" Tackle Blocks	50 %
"Novelty" Snatch Blocks	50 %
Parlor-Door Hangers	50 %
Parts for Differential Blocks and Hand Hoists	40 %
Rai road Hangers	55 %
Rail, Double-Flange Barn-Door, per 100 feet, $1.50, net.	
Rail, Extra Heavy, for No. 5 Railroad Hangers, per 100 feet, $3.50, net.	
Rail, Channel, for "Zenith" Hangers, per 100 feet, $2.50, net.	
Rail, Wrought-Iron	25 %
Rollers, for Heavy Doors	50 %
Sash Pulleys	50 %
Shears for "Novelty" Blocks	50 %
Side Pulleys	50 %
Sliding Door Sheaves	50 %
Street Car-Door Hangers	50 %
Stay Rollers	70 %
Tackle Blocks, Japanned	50 %
"Universal" Door Hangers	45 %
Vises, with Offset Jaws	20 %
"Wild West" Door Hangers	45 %
Wood Track Barn-Door Hangers	55 %
"Zenith" Barn-Door Hangers	55 %

L. M. Devore, Freeport, Ill., manufacturer of the New Idea Curry Combs, quotes them at the following prices. Terms, 30 days, with a discount of 2 per cent. for cash in 10 days:

	Per doz.
No. 1—Flexible Back, Russet Leather	$3.00
No. 2— " " Patent Leather	2.50
No. 3— " " Sharp Tooth	2.25

James L. Haven Company, Cincinnati, Ohio, announce the following special prices, the pages being those in their discount index No. 123:

Page.		
4,	No. 6 Axle Pulleys, 2 inch, per doz.	$0.20
4,	Bedstead Fasteners, per lb	.03
5,	Tire Drills, No. 2, per doz	15.00
6,	Chain Pump Chain, no button, per lb	.04½
6,	" " " with " "	.05
6,	Wood Chain Pump, curbs complete, per doz	13.75
6,	Wood Chain Pump, curbs bolted, per doz	16.75
6,	Wood Chain Pump, curbs, no iron-work, per doz	8.75
8,	Dog Irons, per lb	.02
9,	Grindstone Fixtures, No. 25, per doz	2.60
9,	" " No. 27, "	2.80
10,	Ox Shoes, per lb	.05½
10,	Tailor Irons, per lb	.04½
10,	Plow Clevises, per lb	.04½
11,	Stove-Lid Lifters, off net list	10 %
13,	Corn Shellers, Eagle, each	5.50
13,	" " I X L, "	5.25

The Ammunition Association have recently held several meetings, in which matters connected with their organization have been under consideration, with a view to determining the best methods to be adopted to correct the irregularities which have recently existed. No decision has yet been reached, and it remains to be seen what changes, more or less radical, in the existing system it will be deemed advisable to make.

The manufacturers of Wagon and Carriage Springs are in session, and the question of prices is receiving attention. It is understood that the steel used in making these goods has been withdrawn from the combination which has heretofore regulated its price, and that materially lower quotations are made on it. It is thought probably this may have some effect on the prices of Springs, but on this point at the time of writing no definite decision has been reached.

An important meeting of the manufacturers of Nuts was held at Buffalo, N. Y., October 26, all of the members of the association being present. As stated below, a slight advance in prices was made, and action was also taken regulating the prices of Hexagon Nuts, which have recently been in open market. The revised quotations are as follows, terms 60 days or 2 per cent discount for cash:

	Off list.
Square Nuts, Plain, Cold Punched	5.4¢
Square Nuts, Plain, Hot Pressed	5.4¢
Hexagon Nuts, Plain, Cold Punched	5.5¢
Hexagon Nuts, Plain, Hot Pressed	5.9¢
Square or Hexagon C. T. R.	5.2¢

A slight discount for quantity purchased during the balance of the year was also determined upon. Deliveries remain as before.

The Sash Weights of the T. B. Harkins Foundry Company, Bristol, Pa., in carload lots delivered in New York are $23 per ton. They are made on a molding machine of Mr. Harkins' invention, and their regularity and smoothness of finish are points made in regard to them.

A. J. Phillips & Sons, Fenton, Mich., have put on the market several new Snow Shovels for the present season. Their No. 20 is to meet the demand for a strong and durable article of greater capacity than their other Shovels, and has a sharp ice-cutting malleable iron top, and is put together by an improved method. Their No. 22 is made after the pattern of their No. 2, and is intended to take the place of their old No. 3 as an extra cheap Shovel. They are also introducing a new fancy toy Shovel, which is described as handsomely plated, stenciled and varnished and a plain toy Shovel for children. In addition to these goods they are making a special Shovel of the Bishop pattern for New England trade. The following are the prices on their line of Snow Shovels:

	Per doz.
No. 1, long handle	$2.00
No. 1, long or short D handle	2.20
No. 2, long handle	1.90
No. 2, long or short D handle	2.10
No. 3, long handle	1.60
No. 20, Ice Cutting Tip	3.00
No. 20, Bishop pattern	3.00
No. 20, special	2.75
No. 22, Iron Tip	1.85
Boys' Shovels	1.50
Boys' Shovels, D handles	1.70
Plain Toy Shovels	1.50
Fancy Toy Shovels	2.00
Single Snow Scrapers	2.25
Double Snow Scrapers	2.75

Their circulars also represent patent Double Scrapers and Single Scrapers, both of which are furnished with Steel Shovels. The Double Scraper is made to push or pull.

F. S. Dangerfield, Auburn, N. Y., quotes his Igniting Match Box at $1.50 per dozen, with Cigar Clippers $2.00, delivered.

Postal Package Company, Baltimore, Md., issue a circular, October 10, giving prices on their Perfect Postal Packages in lots of 100 to 1000, mentioning a discount of 30 per cent.

Items.

The Hardware Merchants' and Manufacturers' Association of Philadelphia opened their new rooms in the Drexel Building on Tuesday evening, October 16. The meeting was called to order at 6 o'clock, and after the routine of business was disposed of the members, 23 in number, adjourned to the Bullitt Building, where an excellent dinner, lasting nearly four hours, was enjoyed. The occasion is referred to as one that brought out much talent in connection with the toasts, songs and other exercises. The association was organized through the instrumentality of Samuel Disston, of Henry Disston & Sons, on the occasion of a supper given to members of the trade at his residence, February 6, 1886, and has held meetings regularly each month since that time. These meetings have been productive of a warm and friendly feeling among the members, in addition to the correction of some abuses that had existed in the trade. Its present officers have held their positions since its organization and are as follows: W. J. Lloyd, president; Fayette R. Plumb, vice-president, and E. D. Eyre, secretary and treasurer. There is also a standing executive and grievance committee. The association contemplates having a complete library of price lists of Hardware manufacturers of the country, and we take pleasure in mentioning to manufacturers the fact that

the association desires that the latest editions be sent to their rooms, 912 Drexel Building, Philadelphia.

A. W. Kingsland, who was for many years connected with the Northwestern Horse Nail Company, of Chicago, and in that capacity became well known to the Hardware trade of the West, has been appointed general agent of the Au Sable Horse Nail Company, of New York. He has opened an office at 142 Lake street, Chicago, and will carry a stock of Nails, from which prompt shipments can be made to buyers in the section tributary to that city.

The Hiram Holt Company, E. Wilton, Maine, manufacturers of the Lightning Hay Knives, have completed their new shops, and since the middle of September have been running them overtime. These shops are said to be exceptionally fine and complete, and are the only ones, we believe, run exclusively in the production of Hay Knives. The demand for the Lightning Hay Knife has been unusual this season, and the stock of finished goods on hand at the time of the fire was exhausted sooner than the company expected. Hence there was some unavoidable delay in filling orders. The company are now, however, in condition to respond promptly to all demands. In this connection the company advise us that they have been informed that Hay Knives branded Lightning Pattern are being quoted among jobbers, and desire it to be understood that Lightning as applied to Hay Knives is their exclusive property, and as a trade-mark has been duly registered, so that the use of this name by other parties will promptly be proceeded against according to the law relating to trade-marks.

The Hardware Trade Cleveland and Thurman Association, with headquarters at 27 Chambers street, participated in the business men's parade last Saturday, and the Harrison and Morton Hardware Club are making arrangements for the parade next Saturday.

The Moore Mfg. and Foundry Company have removed their office and wareroom from 51 and 53 Franklin street, Chicago, to their works at Fowler and Nineteenth streets, Milwaukee, Wis. They have just put their new plant in operation. It consists of a completely equipped machine shop, foundry, forging rooms, and japanning and annealing ovens. They will manufacture their own line of Hardware Specialties and will compete for orders for gray iron castings, light machine work, forging and japanning. They have just issued a 50-page catalogue devoted to their line of goods. In its pages they illustrate and describe off-set jaw vises, Wild West and Climax door hangers, railroad hangers, rails and fittings for hangers, Novelty tackle blocks, hay-fork pulleys, log binders, carriers for hand-hoist and differential blocks, differential pulley blocks, portable and stationary hand-hoists, anti-friction sash pulleys, sliding-door sheaves, dumb waiter pulleys, door rollers for heavy doors, street-car door hangers, wood track hangers, Acme barn door rollers, detachable log haul chains, endless chains, or links for chains, ice elevator chains, &c. Complete price lists accompany the descriptions of the various articles included in the contents. The catalogue is well printed on good paper and is of convenient size.

Sidney Shepard & Co., Buffalo, N. Y., have issued a new catalogue of goods manufactured and for sale by them. It relates to Stamped Ware, Deep and Shallow Pieced Tinware, Japanned Ware and miscellaneous goods. In the latter department are represented some of the specialties of the company. Creamery Pails and Trimmings are also represented, as well as Coal Vases, Toilet Ware, &c. For the information of the trade a list of the goods kept in stock in addition to their manufactures is appended.

E. T. Barnum, Detroit, Mich., in his fall catalogue No. 160 illustrates a variety of Wire articles, Wire Cloth, Counter Railings, Crestings, &c., and calls attention incidentally to other articles in his line. His catalogue No. 163 is devoted to Builders' Wire and Ironwork, and relates especially to Crestings, Roof Crestings, Finials, Town Ornaments, Office Railings, Mangers, Hay Racks, &c., Stair and Balcony Railing and Wrought Iron Fences.

J. F. Wollensak, Chicago, Ill., issues a circular devoted to Electric Bell Sets. The style of box in which each set is put up is shown, and also other illustrations given representing the goods and the manner in which they can easily and efficiently be displayed.

The Herendeen Mfg. Company, Geneva, N. Y., issue a pamphlet entitled "How Shall We Heat," in which reference is made to Open Fireplaces, Hot-Air Furnaces and steam or hot-water systems. The Furman Heater, which may be used as a hot-water or steam generator, is especially referred to, and its durability and simplicity as well as its efficiency in operation alluded to.

The Hardware store of Weaver Brothers, at Downs, near Bloomington, Ill., was destroyed by fire on the 26th ult., involving a loss of $5000.

A corporation will be formed under the style of the C. H. Gurney Company to succeed the firm of C. H. Gurney & Co., 247 Lake street, Chicago, manufacturers' agents for the sale of Hardware.

Charles A. Wright, a prominent Hardware merchant of Aurora, Ill., died on the 20th inst. He was an old citizen of that place and was universally esteemed for his many excellent qualities of head and heart.

Haff & Walbridge, 76 and 78 Leonard street, New York, issue a catalogue relating to the line of notion specialties which they manufacture. The goods are intended for the notion, stationery and Hardware and druggists' sundries trade. It includes a line of Corkscrews, Razor Strops, Thermometers, Tape Measures, Button Hooks, Match Stands, Pencil Holders, &c.

H. T. Wakeman, successor to Browning, Sissum & Co., manufacturers of Belt Hooks, Cotters, Spring Keys, D Rings, Staples and other goods in this line, will continue the business of the late firm at the old stand, 85 Chambers street, New York

James L. Haven Company, Cincinnati, Ohio, issue a circular relating to the Little Giant Corn Crusher in which a full description is given, with testimonials. They also issue in leaflet form illustrations of their Iron Chain Pump Curbs and Wood Chain Pump Curbs, of which list prices are also given.

Gage & Joost, 243 Water street, New York, are sole agents in the United States for Anti-Rust. This is a preparation for preventing rust on nickel-plated work, polished edges and all bright metal surfaces.

The trade will observe the advertisement of Joseph Churchyard's Sons, Buffalo, N. Y., in which they call attention to the line of Refrigerators, Ice Chests, &c., which they are manufacturing. In this departure they are putting a new line of goods on the market and are in position to take the orders of the trade for the coming season. The name of the concern is doubtless familiar to most of our readers through the reputation they have on Bellows, and it has been facetiously remarked that they are in this departure like the man in Grimm's fable who blew hot and blew cold, as they have been blowing hot for years with their Bellows and are now blowing cold with their Refrigerators, and it is intimated that by judicious use of their different products the public should be able to maintain a comfortable temperature. With reference to their new line of goods, they claim to have a non-condensing Refrigerator, and refer to their styles as new and different from any now offered to the trade.

Haydock & Bissell announce an auction sale, November 14 and 15, at their rooms, 12 Murray street and 15 Park place, New York. The sale covers a large line of Table and Pocket Cutlery, and also goods suitable especially for holiday trade. Full particulars will be given in our next issue.

In the catalogue of the Gould Mfg. Company, Seneca Falls, N. Y., to which we referred in our last issue, there are a great many new goods represented which are deserving the attention of the trade.

The Collins-Gibbons Mfg. Company, St. Louis, Mo., issue a circular describing their Automatic Wire Straightening and Cutting Machines and the Little Giant Wire Cutter, to which we shall have occasion to refer hereafter.

The E. C. Meacham Arms Company, St. Louis, Mo., have issued a 50-page price list, October 20, in which they represent a large line of Arms, Ammunition, Sporting Goods, &c. List prices with discounts in characters are given, a key to the quotations being also furnished.

Tendencies in Trade.

Referring to the general tendencies in the trade, especially in regard to the proportion of goods purchased from manufacturers and jobbers, we have the following advices for our subscribers in different parts of the country:

Marshalltown, Iowa.—As I observe it, the character of the Hardware business is undergoing a change. I find it growing less legitimate each year in this: that Hardware is no longer a proper word to express the merchandise that so-called Hardware dealers sell. This idea applies more particularly to the larger jobbers in the Western Central States. I observe that the combined small jobber and large retailer is growing more numerous throughout the United States, and that the purchases of this class, as well as the purchases of the better retailers only, are made from the manufacturers. The larger jobbers, to meet this, are placing these other goods, doing so to maintain former volume and income. As I see it, the manufacturer is getting nearer the consumer through the afore mentioned lesser jobbers and retailers. The jobbing business is not increasing in the ratio that consumption is increasing.

Rock Island, Ill.—I have been in the trade over 20 years, and I think there are fewer jobbing houses now than in 1867. More places to buy goods, no doubt, but the larger number represent the manufacturers. The smaller jobbing houses have multiplied, in fact there are one or more in every good-sized town that supply a local trade, but we refer to the larger cities. New York has not a leading jobbing Hardware house that does not represent or is not a manufacturing concern. Were it the proper thing to do we might name many in that city and others that are out of business and none to take their places, except the manufacturer. Why is it that the manufacturers are placing in Chicago, St. Louis and other cities agencies and depots of supplies unless it is to reach the retail trade, and, if the retail trade did not support them, would they stay simply to supply jobbers, when they could reach them much more cheaply? Our theory is that the retailer will go the manufacturer first, because he knows what he is getting, and, if the goods are not what they are represented to be, he has no trouble in getting at the responsible party for damages. Secondly, because, if he wants a reliable, steady trade, he must have a good line of goods and a special line in many things, and in buying of jobbers he cannot do it, as they change so often it is impossible. The jobber buys where he can buy the cheapest and cares nothing for name or brand, except his own, and often the dealer

has made a special point in regard to certain makes of goods, and, running short, he sends his order for the make he has been selling His jobber is "out just at this time" of those particular goods, but have "sent you something just as good or better." When his goods arrive, to his disgust, he finds the very make he has been competing against. Another very good reason why it is better to buy of the manufacturer is that your goods come to you in better shape—fewer broken packages and no shelf-worn goods. In many lines it is more convenient to the average dealer to buy of the jobber, but the best retail dealers will buy more and more of the maker of the goods, where generally there is no boxing or cartage to pay, and where with allowance for freight he will be able to put the goods in his store for the price that the jobber wants for them.

Red Wing, Minn.—Concerning retail dealers in general, who buy in small quantities only, I concede there is no tendency toward buying direct from manufacturers, as goods can be bought just as cheap from jobbers.

Detroit, Mich.—We have observed the Straub table in *The Iron Age*, but have never kept any statistics of the kind. Owing to the fact that in our specialties we carry a larger variety than the jobbers, it has always been necessary for us to buy of the manufacturers of these lines, which include Tools and Builders' Hardware. Our trade with the jobber is therefore comparatively small. In this city we find jobbers a very great convenience, however, as we can buy staple goods of them to advantage—the small difference in cost being made up by our not having to carry so large a stock.

Waterville, N. Y.—We have read the table of Messrs. Straub & Co. with much interest. We are buying more goods of the manufacturers than formerly, and, as a general thing, find it much more satisfactory than buying through the jobbers. We can usually get better prices and the goods come in much better shape—that is, better packed, less broken and soiled packages, &c. We were largely influenced to buy direct of manufacturers to protect ourselves against the jobbers, as they show great energy in drumming up the consumers' trade in this section, so we are forced to put ourselves in a position to meet them as competitors.

Greenville, Mich.—Think that we buy fully as large a per cent. of our goods of manufacturers as Messrs. Straub & Co.'s table shows, but mostly of Eastern manufacturers. We buy but little West. Think the matter stands almost like this: The manufacturers pick out the best retail trade and drum them and offer them inducements to buy, taking into consideration the prompt paying qualities, more than the size of the sale or the magnitude of the firm's business. And among prompt paying firms we think purchases will reach nearly 75 per cent., while among the smaller firms nearly 75 per cent. is bought of jobbers. That is the way it looks to us.

Bath, N. Y.—We have always preferred to buy of jobbers for the reason that we can buy in such quantities as our wants require at prices a little above the manufacturer, and if we get quantity prices of manufacturer we would feel obliged to buy in larger quantities, and the result would be an overstock of goods and unpaid bills.

Trade Topics.

A facetious correspondent, signing himself "Traveler," writes us as follows:

Pardon me for writing such a cranky letter, but really I can hold myself no longer. I am not a stove founder, consequently have nothing to lose as such, but may lose my position on the road on account of my employers closing up shop if the cause of my trouble continues. You ask what it is. Simply this: the manufacturers are being driven crazy by a new fake (similar to the Bohemian Oats swindle) now practiced by the retail dealers all over the country. It is not a new trick by any means, but is being played this year for all it is worth, and plenty of the too over-anxious are always ready to bite.

"For my own use" is the trick. "O, Heavens, it is vile." The retailer writes in asking for a price on a certain stove in your catalogue saying it is for his own use and wants you to make it as low as possible. Of course it is hard to refuse a good customer an extra discount of some kind, and if you allow it once you will be surprised to find how many stoves your customers need for their own use. We have had so many letters of that kind in the past few days that I hardly think it safe for any man living, Sullivan included, to enter our office in search of a stove or even a fire-back for his own use.

The manufacturer who sells a stove giving an extra ten "for my own use" is more to blame than the man who asks it, as it is the second law of nature (first with some) to buy everything as cheap as possible. I hope the manufacturers will break up this paralyzing practice and tell the festive retailer not to use so many stoves. It is expensive for coal, you know.

Arrangement of Stores.

From P. M. Church & Co., Sault de Ste. Marie, Mich., a description of whose new store we gave some time ago, we have received information in regard to their Combined Stair and Elevator, the construction of which is illustrated in Fig. 285. It is referred to as a convenient method of arranging an elevator where room is an important factor. The car, it will be observed, runs on rails placed at the side of the stairway, a counter weight balancing the platform. The power can be either a set of pulleys or a winch or crab placed up stairs so that a rope can be attached to it. The size of the car deck best adapted for Hardware stores is probably about 4 x 5 feet, but on stairs not having a pitch of more than 30° the car may be lengthened to 7 or 9 feet, and we are advised that it will then work quite as well as far as its equilibrium is concerned. The pitch of the stairs, however, should not exceed 45°. The less pitch there is, the easier, of course, will be the operation of the elevator. Any number of stories may be reached by this device, but it is intended to extend from the basement to the second floor. The rails are of iron and flat, planted on the stair strings. The first or inner part of the rail is ¾ inch wide by ¼ inch thick, screwed on the top of the inside of the string or carriage, and the second part is 1 inch square and screwed on the outer top, forming a rebate on the top, in which the rollers are thus guided. This detail of the construction is illustrated, it will be observed, in Fig. 723. This arrangement is referred to as convenient and satisfactory in its working, and we are advised that a load can be lifted much more easily on this inclined plane than where the lift is direct.

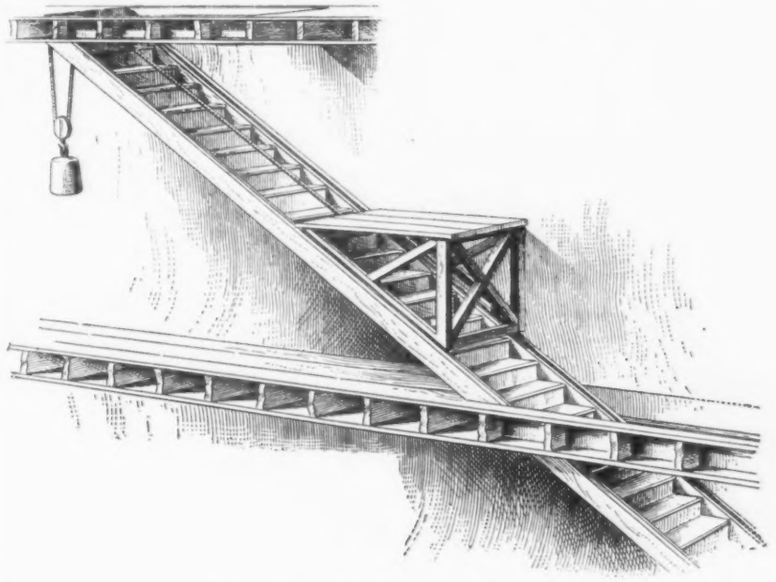


Fig. 285.—Combined Stair and Elevator.

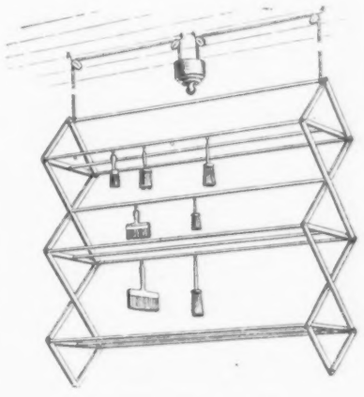


Fig. 286.—Brush Rack.

From the same parties we have a description of the Brush rack shown in Fig. 286. This rack is made by cutting down a clothes-horse, using only the principal portion and suspending it with cords, pulleys and counterweights from the ceiling. For attaching samples small screw eyes are inserted in the rack, the eyes being twisted a little to one side so as to form a hook, curved so that anything can be taken off only by lifting and twisting slightly, like a whiffletree hook. When the rack is thus prepared samples of Brushes are taken and small screw eyes placed in the ends. Each Brush is marked with cost and selling price per dozen, as well as a number corresponding to the number of the box in which the stock is kept. In operation a customer calls for a Brush. The rack is pulled down to the proper level for his inspection, thus permitting him to see at a glance what he wants, examine the article and give that critical inspection so pleasant to the average buyer. The salesman knows the box number and can without trouble hand him a Brush clean and fresh from the stock. The advantages of handling Brushes in this way are referred to as obvious, and among them may be mentioned the saving of clerks' time, the elegant and effective display, saving general stock from constant handling, resulting in damage to the goods, and the ease with which samples are disposed of when the sale is completed. As a counter weight a shot bag is used, which can be loaded more or less heavily as samples increase or diminish.

A new and convenient case for the accommodation of Tacks, Nails and other goods is illustrated in Figs 287 and 288. It is the invention of W. G. Barnes, of Larabee & Barnes, Amsterdam, N. Y

and was patented in July of the present year. Fig. 287 gives a general view of the case, while Fig. 288 shows the construction of the separate boxes which are used in it. This case is designed to furnish means whereby Tacks, Nails, Wire Brads, Staples and similar articles may be more readily handled than by the methods usually employed by Hardware dealers. The size of case as shown is as follows: Length, 35½ inches; depth, 13 inches; hight, 19¼ inches. The boxes, Fig. 288, are intended to be made of metal and will contain about 25 pounds. When to be filled they may be drawn out of the case

Fig. 287.—Case for Tacks, Brads, &c.

and placed in any convenient position, and the article poured into it, when the bin can be replaced in the case. The goods can obviously be taken in small or large quantities with the use of a small rake, the scale-pan being held under the bin to receive them. It will be understood that the case as shown, Fig. 287, contains two rows of receptacles, each of which is closed by a cover, which is operated as shown. In this case the upper tier is devoted to Tacks and the lower to Wire Brads, the name WIRE BRADS being visible when the lid is closed. The numbers on the under side of the covers denote the size or quality of the articles contained in the boxes under them, and may also have the cost and selling price thereon. This case is alluded to as especially adapted for the handling of Tacks in bulk, Wire Brads,

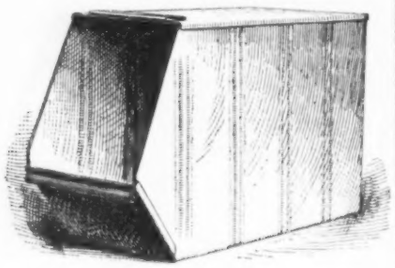


Fig. 288.—View of Box.

Horse Nails, &c., and is offered as a convenient device for this purpose. It is rereferred to as working exceedingly well in practice and obviating the difficulties that are usually found in managing the line of goods for which they are especially designed.

Condition of Business.

From Louisville, Ky., we have the following report under date October 27:

The Hardware trade of Louisville, Ky., for the past week has been a great improvement over the previous one. General orders are large and entirely satisfactory; this is particularly the case with shelf goods, on which the jobbers realize reasonable profits. Gunning season having arrived, Ammunition naturally forms a large part of country orders.

Shipments this week are very heavy, with many specifications left unfilled for lack of capacity to get them off. The increased demand appears to be general and betokens permanent improvement. The urgent demand for Light Sheet Iron has been relieved by the mills catching up with orders. Bar is freely offering from mills, but prices remain firm so far.

Cut Nails have again gone all to pieces; trade in them being completely demoralized by continued cuts offering and further helped downward by several speculative lots selling at ruinous prices. Overproduction is recognized as the prime cause of the evil, but then the demand from the country has been small this fall.

Stove jobbers and foundries are having good business, the increased amount of goods going out about equaling lower scale of prices formerly prevailing.

From Fremont, Neb., we have the following advices in regard to the condition of trade and the outlook:

Small grain was not as good here as it usually is. Hence collections have been a little slow. The corn crop is good, well matured and acreage large. Collections should come in well later on. Trade is good, and I look for it to continue so until winter sets in and puts a stop to building. In short, our country here seems to be in a good and prosperous condition.

From Michigan we have the following advices in regard to trade:

While the volume of business is somewhat late in coming forward, trade on the whole is in a healthy condition. Customers, while supplying their needs, are cautious in incurring obligations, and there is a growing disposition to pay cash. Indications are good for future trade.

Recent Exports in Hardware and Related Lines.

PER BARK MYVANROY, OCTOBER 1, FOR PORT NATAL, AFRICA.

By H. W. Peabody & Co.—8 cases Sewing Machines, 31 packages Hardware, 20 packages Agricultural Implements, 50 dozen Shovels, 480 dozen Handles, 165 bundles Sash Weights, 223 packages Agricultural Implements, 87 packages Hardware, 1 case Pumps, 4 crates Churns, 8 cases Hardware, 49 packages Carriage-ware, 12 Axles, 2 cases Bolts and Nuts, 2 packages Lawn Mowers, 13 Sewing Machines, 300 pounds Nails, 120 dozen Handles, 1 case Tools.

PER BARK ROSE C., OCTOBER 9, FOR PORT NATAL, AFRICA.

By New Home Sewing Machine Company.—34 cases Sewing Machines
By Marcial & Co.—10 cases Rims, Spokes, &c., 828 pounds Nails, 2226 pounds Mule Shoes, 3498 pounds Nails.
By J. Norton & Son.—48 Plows.
By W. H. Crossman & Bro.—39 cases Plow Parts, 15 dozen Axes, 57 cases Plow Parts, 29 dozen Axes, 100 dozen Shovels.
By Arkell & Douglas.—360 Hammers, 10 dozen Axes, 16 dozen Picks, 20 dozen Handles.
By H. W Peabody & Co.—6 dozen Handles.
By Corner Bros. & Co.—54 cases Hardware, 8 cases Agricultural Implements, 177 cases Hardware.
By Coombs, Crosby & Eddy.—22,453 pounds Coil Wire, 6 Corn Shellers, 31 dozen Plow Parts, 78 Clocks, 5 dozen Plow Parts, 176 Plows, 6 Corn Shellers, 356 dozen Handles, 1 dozen Washing Machines, 2 dozen Carpenters' Tools, 3 Corn Shellers, 20 Meat Cutters, 2 Sausage Stuffers, 6 Churns, 1 dozen Wheelbarrows, 8 dozen Wrenches, 18 Lamps, 4 dozen Axes, 27 Pumps, 19 dozen Hardware, 5 Corn Shellers, 6 Churns, 2 Sausage Stuffers, 14 dozen Wrenches, 9 Lamps, 9 dozen Axes, 1 dozen Wheelbarrows, 16 Pumps, 21 Saws, 12 dozen Hardware.

PER BARK WM. PHILLIPS, OCTOBER 11, FOR WELLINGTON, NEW ZEALAND.

By Mailler & Duereau.—60 dozen Shovels, 300 dozen Handles, 25 cases Sewing Machines, 100 dozen Handles, 20 dozen Handles, 4 cases Saws, 2 cases Saws.
By Arkell & Douglas.—3 cases Carriage-ware, 30 pairs Rims, 2 gross Stove Polish, 5 dozen Saws, 5 dozen Hammers, 5½ dozen Wrenches, 60 pounds Hardware, 4 dozen Axes, 21 dozen Wire Goods, 4 dozen Fruit Presses, 1 dozen Lampware, 2 dozen Lampware.
By A. Field & Co.—11 Stoves, 6 dozen Stove Repairs, 1 gross Blades, 3½ dozen Hardware, 7 sets Axles, 9 pairs Springs, 1½ dozen Tool Chests, 240 pounds Horse Nails, 3000 Bolts, 10 pairs Hardware, 1 dozen Razor Strops, 6 gross Hooks, 4 dozen Fire Sets, 4 dozen Bird Founts, 3 gross Molds, 2 dozen Tools, 3 dozen Can Openers.
By A. S. Lascelles & Co.—1 case Handles.
By H. W. Peabody & Co.—44,800 pounds Barb Wire, 5 cases Harness and Parts, 5 packages Pumps, 50 cases Hardware, 252 pounds Castings.
By R. W. Forbes & Son.—15 packages Hardware, 12 dozen Axes, 4 packages Churns, 1 case Toys, 172 dozen Handled Axes, 21 sets Axles, 3 dozen Wringers, 14 dozen Forks, 18 dozen Spade Handles, 63 dozen Handled Axes, 200 papers Lining Nails, 14 dozen Wringers, 3 packages Carriage Hardware, 7 packages Hardware, ½ dozen Wheel Jacks, 355 pounds Tire Bolts, 9 Lawn Mowers, ¼ gross Rat Traps, 6 dozen Hammers, 1 case Stamped-ware, 1 case Kitchen-ware, 17 packages Hardware, 8 dozen Hammers, 5 gross Blacking, 5 gross Fruit Jars, 1 case Hardware, 15 dozen Spade Handles, 48 packages Carriage Woodwork, 9 packages Agricultural Implements.
By Coombs, Crosby & Eddy.—6 dozen Shovels, 2 cases Slates, 1 Lathe, 137 pounds Oil Stone, 6 dozen Traps, 6000 feet Safety Fuse.
By W. H. Crossman & Bro.—5 cases Carpenters' Tools, 1 case Mower Parts, 3 Drilling Machines, 1 Washer, 124 pounds Rubber Springs, 40 dozen Handles, 2 casks Pumps, 6 dozen Mouse Traps, 3 dozen Dashers, 872 pounds Nails, 6 gross Wicks, 3 dozen Grindstone Fittings, 255 pounds Tacks, 12 dozen Scythe Stones, 1½ dozen Wringers, 3360 pounds Axle Grease, 13 Stoves, 550 pounds Horse Nails, 1250 pounds Horse Nails, 3 Blowers, ¼ dozen Mangles, 287 pounds Rivets, 2 dozen Bush Hooks, 3 dozen Grindstone Fittings, 2 cases Harness, 25 dozen Axes, 15 cases Hardware, 3 cases Hardware, 7 cases Hardware, 6 cases Carriage-ware, 1 case Tire Benders, 2 barrels Pipe Fittings, 1 case Hardware.
By Woodhouse & Stertz.—2594 pounds Axles.
By New Haven Clock Company.—84 boxes Clocks.
By F. B. Wheeler & Co.—18 sets Wheels.
By Welch & Lea.—4 cases Iron Bolts.
By Plumb, Burdict & Barnard.—1370 pounds Iron Bolts.
By Meriden Britannia Company.—6 packages Plated-ware.
By Singer Mfg. Company.—555 cases Sewing Machines.
By Joseph Dixon Crucible Company.—92 pounds Lead Pencils.
By Russell & Erwin Mfg. Company.—9 cases Hardware.
By W. & B. Douglas.—8 packages Pumps.
By Ansonia Clock Company.—46 boxes Clocks.
By Goulds Mfg. Company.—1330 pounds Pumps.

PER SHIP JOAQUIN, OCTOBER 13, 1888, FOR SYDNEY, N. S. W.

By J. L. Mott Iron Works.—46,202 pounds Cast Iron Stoves.
By W. K. Freeman.—3162 pounds Tackle Blocks, 24 bundles Lamp Goods, 75 dozen Edge Tools, 7 packages Hardware, 2 cases Saws, 165 pounds Drills, 12,557 pounds Axles, 22 crates Churns.
By F. B. Wheeler & Co.—216 dozen Handles, 4 dozen Axes, 6 cases Boys' Wagons, 51 packages Clocks, 67 sets Harness.
By Collins Company.—256 dozen Edge Tools, 80 dozen Picks, 100 dozen Edge Tools.
By Winchester Repeating Arms Company.—250 Guns, 85 sets Tools, 50,000 Metallic Cartridges, 10,000 Metallic Cartridges, 300,000 Primers, 24,000 Metallic Cartridges, 3000 Shells, 25 Guns, 7000 Metallic Cartridges.
By H. W. Peabody & Co.—15 cases Type-Writers, 44,810 pounds Fence Wire.
By Seth Thomas Clock Company.—4492 Clocks.
By C. E. Renshaw.—21,343 pounds Axle Grease.
By Ansonia Clock Company.—25 boxes Clocks, 115 boxes Clocks.
New Haven Clock Company.—28 pounds Clocks.
By E. W. Harrison.—2 cases Steel Tools.
By Russell & Erwin Mfg. Company.—15 cases Hardware.
By John A. Ten Eyck.—4 cases Carriage Springs.
By Barber & Co.—915 pounds Iron Castings.
By A. Field & Co.—5 gross Hammers.
By Simpson, Hall, Miller & Co.—210 pounds Plated-ware.
By Fairbanks & Co.—2289 pounds Scales.
By W. & B. Douglas.—11 packages Pumps.
By Rogers, Smith & Co.—1 box Plated-ware.
By Healy & Earl.—5 cases Grain Mills, 1 Hay Press, 13 cases Wood-Working Machinery, 5 boxes Emery Wheels, 1 box Pumps, 2 boxes Saws.
By Meriden Britannia Company.—20 boxes Plated-ware.
By Arnold, Cheney & Co.—1 case Wheels, 11 cases Carriage Hardware, 18 cases Wheels, 4 cases Carriage Springs, 52 cases Axles, 7 cases Wagons, 8 cases Carriage Hardware, 37 cases Axes, 8 cases Saw Mills, 7 cases Hoes, &c., 17 cases Handles, 9 cases Iron Castings.
By Ilsley, Doubleday & Co.—6 gross Egg Beaters, 10 gross Can Openers, 1½ dozen Banks, 1 case Toys, 9 cases Castings, 18¾ gross Axle Grease, 6 dozen Step-Ladders, 41 Stencils, 448 pounds Pumice Stone, 4 dozen Paint Brushes, 130 pounds Glue, 2½ gross Axle Grease.
By R. W. Forbes & Son.—32,149 pieces Roofing Slate, 13 boxes Sewing Machines, 50 sets Harness, 1 Carriage, 2 cases Carriage Hardware, 6 packages Machinery, 1 box Plated-ware, 1 case Toys, 2 cases Hardware, 22 packages Agricultural Implements, 11 packages Corn Shellers, 14 packages Machinery, 7 packages Guns and Parts.

By A. S. Lascelles & Co.—6 gross Axle Grease, 6 cases Tacks, 50 dozen Washboards, 1 case Toys, 3 cases Toys, 12 gross Pencils, 57 cases Slates, 2 gross Mouse Traps, 2 cases Firearms, 1 gross Wrenches, 2½ gross Saws, 3 dozen Money Drawers, 100,000 Primers, 2000 Cartridges, 1½ gross Padlocks, 1 case Blocks, 6 dozen Scissors, 1 case Firearms, ½ dozen Cork Pullers, 3 boxes Brackets.

Science vs. Familiar Things.

By Knarf.

What is more familiar to us than stoves, and yet how unfamiliar are the most familiar things. For instance, the writer remembers, in his boyhood days, the kitchen stove, and that a large iron pot always stood on the left-hand back griddle hole, with water in; so there could have been no reservoir to the stove. The construction was not of the elevated oven type, nor of the crank stove, where the lids were revolved at pleasure over the fire, by the aid of a crank and cog-wheel working in corresponding cogs on the underside of the top of the stove, which was necessarily circular. My memory of this stove was contemporary with about 1858 or '59. We had a "Dutch oven" built in connection with the chimney, with the feed door, also the oven door, built to open into the kitchen. This oven I never saw used, and why it was built I never knew. The house was built about 1852, and that must certainly have been after people were dependent upon a tin reflecting oven, before an open fireplace. I know some of our neighbors' houses had the same "Dutch oven" arrangement in them. The "Dutch oven" of that day, was similar to the bakers' oven of the present time. This, with an open fireplace for wood, took nearly all the space on one side of a large kitchen, as it was one continuous brick front, the oven flue merging into the fireplace flue before it reached the top of the chimney. But to return to the stove; though I can see that stove standing in our kitchen, black, with no attempt at ornamentation or nickel; and, though it burned wood—and a good deal of it—I cannot tell the make, nor number, nor date of patent.

I was not far enough along in stoveology to be interested in these matters. I know about this time my father tired of changing this stove from the kitchen to the woodshed, in summer, and from the woodshed to the kitchen again in the fall. I surmise, too, that the stove was getting the worse for wear; so it was not brought back into the kitchen one fall, but a new one took its place. I think my mother preferred the old stove to cook in. And so I was in the same house for years with this cook stove. I can tell nothing in particular about it.

What science does the average husband try harder to learn than that of putting up stoves? Each fall presents the same question, and each time he tackles the problem fearlessly, and it usually results in a stove man being called. The same pipe was used last year, when the stove stood just where you want it again this year; this pipe has shrunk and won't fill the bill, though it was all put away together in the spring and hasn't been touched since until you try to put it together and make it reach. Then, too, after you have tried to put all the big ends of the pipe together, and then all the small ends together, you feel so mean, and yet somewhat relieved, to see how easily the pipe fits together, and stretches the required length in the skillful hands of a tinner.

The same question comes up in the household each fall: How are we going to arrange for heating this winter? The self-feed base-heater is not suitable for early fall or late spring, and it is such a nuisance to burn wood for a while and then have to change to a coal stove. Four stoves are necessary for the safe conduct of a family through each year. A gasoline stove for cooking in summer and a cook stove for winter. A wood heating stove for fall and spring and a coal stove for winter. Those who have furnace, grate and gas stove are not troubled as other men are.

The stove question is a troublesome one to any family in moderate circumstances, whether it be the getting of a cook stove or a heater. After the question that there has to be a new stove, by the inability of the old one longer to fill the requirements of the family, the next question is, "What kind?" The neighbors' stoves are brought up for comparison, and the beauty and utility of Mrs. Smith's is compared with that of Mrs. Jones's. The wife takes occasion next day to "look around" among the stove stores, and after being shown the assortment in three or four of them, becomes so bewildered in styles and prices, and where she saw this one, or that one, she can't tell. The daughter takes a look, and comes home with her mind made up as to just the one she would buy. Some evening, a few days later, the old gentleman takes the matter in hand, and is going to have an end of this foolishness. Before he reaches home he has ordered a stove, which proves to be just the one his wife and daughter "would not have under any consideration" when they were looking. The rumpus ensuing is a stayer; in fact, it causes unpleasantness in the family until it is worn out. The science displayed by the salesman in working off the old familiar thing on the husband—the stove that has been on his floor for more than a year—is a standing joke in the store for a long time.

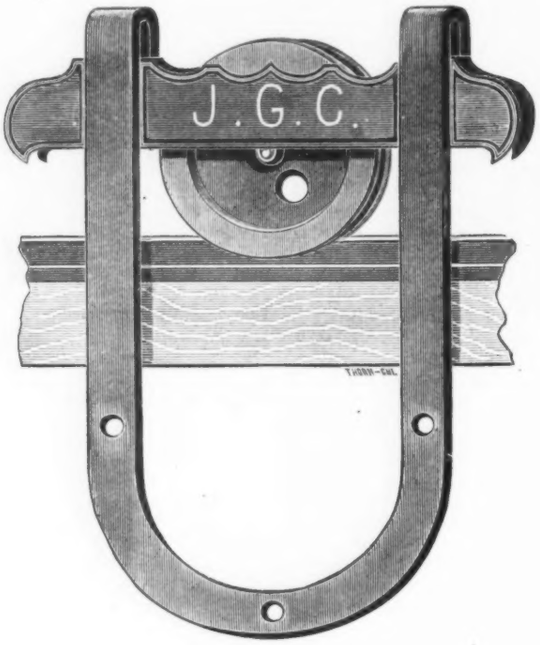
A most unpleasant feature of the stove trade over a large section of our beautiful country is the prominent part "second-hand stoves" play in closing a bargain for a new stove. Horse trading is not to be compared to it. Broken down, foundered, spavined stoves are brought to view, just as good as the day they bought them, splendid heaters or cooks, as the case may be, and the only reason they want to trade is because it is too large or two small, too high to put coal in, or it takes up too much room in the kitchen. But trade we have to, or some one else will, and make the sale of the new stove. And so the merchant's profits on his new stove, or, perhaps, more than the profits, go in the second-hand store. A lease is generally taken for the balance of the payment, the money to be paid in installments, making the final payment due in about six months. Oh! the familiar things are pleasant to deal in. Sometimes we think there is a tendency toward less nickel in buyers' minds, and yet, however strongly they object to a fancy stove, the appointments of this class of goods are usually so much better than the plainer that they choose the nickeled ones. The fall trade on heaters bids to be light, especially in hard-coal base-burners. The high-priced coal is almost prohibitory for the $1.25 or $1.50 a day laborer; $7.50 and $8 coal is beyond their reach. Wood they can buy by the load as their needs be without feeling it so much. Wood stoves of small size and little money are in demand, just to use until coal comes down, which each winter they hope it will do, before the next season. How little idea we have of the grinding poverty of the day laborer,, the man that depends upon muscle instead of brain for a livelihood. Accident or sickness incurs a debt that takes months to pay, and many waste the best years of their lives in trying to make both ends meet. Yet this class of people are the real consumers, the ones the country depends upon to use its products. There is a growing demand among the thinking class for burners that will successfully use oil for fuel, both for cooking and heating. A number of this class of inventions have been put upon the market, but have not filled the place. Some are too expensive or complicated; they are not economical in fuel; they clog up or have to be run in connection with a steam jet. The matter is interesting many minds, and before long some one will make a fortune who gets the right thing for this purpose.

The fact of smaller bills of stoves on first orders, and a more frequent ordering as stocks or assortments become broken, seems to be the order of the day. While stove men try to look at it in a favorable light, it is an open secret they are disappointed. There seems to have been a hope of an increase over last year's business, which, so far, has not been realized. While we hear of large crops through the press, there are few sections West, North or South that are not short on some staple. Where there is abundance of everything, old debts are making the farmers feel poor. There is, no doubt, a change taking place in the manner of doing business, which is wholly the outcome of the necessity of the times. One favorable feature in this perceptible change is a gradual nearing to cash. The stove manufacturers, with large profits, years ago could afford to give long time. The merchant on this long time could afford to sell stoves on leases or monthly payments, until now a cash customer for a stove is a rarity. The stove makers have talked the matter of shortening the time on stoves, but in some way do not see their way clear to do it A shortening of time from first hands would necessitate a corresponding curtailing of liberality on the part of the retailer, which, no doubt, would reduce the number of stoves retailed. The laboring class who break up stoves in moving and buy new ones, or another class who are higher in the dollars and cents and trade off a good stove for one of newer style, are not able to pay cash for a stove.

What the reduction in stove sales would be if every one kept their stove as long as it was serviceable, instead of trading it off simply on account of style, will probably never be determined. There is no doubt but the change in patterns of stoves, especially heating stoves, during the last three or four years, has acted like a tonic to the retail trade. To keep up with the styles of stoves, and have one as good and elaborate as the neighbor, has stimulated the trade, and now, like a sick person, the trade has had a relapse because the tonic is no longer taken, or, if taken, is losing its effect. It is not an unusual thing in some sections of the country to see from 20 to 100 second-handed heaters in stock. Each of these second-hand stoves represents at least the profit of the new stove which took its place, if not more than the profit. A large part of these stoves have been carried over from last year; they had to be put away for the summer, brought out again this fall, polished again, and in many cases will be sold for less than cost to close them out. Is it any wonder that retailers are not placing large orders? The query is pertinent, Why do you trade in second-hand stoves? Because if you do not offer the same inducements as your competitors you will be badly left. They will do such business, and you must. Second-hand cook stoves are generally in demand, being fewer of them on the market. A cook stove is good until it is worn out, as styles change less, and even with more nickel on and swell doors, kickers and pie-removers, the old cook stove remains in the kitchen, and is not intended for show A cook stove that is a "good baker" is so highly prized it is used until the last minute. So, while the cook stove is an old familiar thing, the heater is unfamiliar. New ornaments, jewels, nickel, new shapes and styles are found in our houses each year, and the Morning Glory, Good Record, Shining Light, and many other contemporaries are consigned to the scrap pile.

The J. G. C. Hanger.

This hanger is made by the Coleman Hardware Company, Chicago and Morris, Ill. The frame is described as made of Bessemer steel bent from flat bars while hot. The rider bars are malleable iron with ribbed recesses for frames. The claim is made that the hanger is thoroughly braced, so as to be equal to solid forgings. It is put on the market to meet the demand for a hanger that can be sold in competition with cheap goods. It is made in three sizes, No. 0, No. 1 and No. 2, for 20 feet, 12 feet and 7 feet doors respectively.



The J. G. C. Hanger.

Combined Drill Holder and Countersink.

Wells Bros. & Co., Greenfield, Mass., have recently put on the market the Little Giant Combined Drill Holder and Countersink represented in the accompanying illustration. It is intended for use with regular twist drills, and the point is made that, the countersink following the drill, the job is completed at one operation. The drill, it will be observed, may be set for the depth of hole wanted. It is so constructed that the countersink cutters can be taken out and ground. The hole runs through the holder. This tool is made with $\frac{1}{2}$-inch or $\frac{11}{16}$-inch shanks, the $\frac{1}{2}$-inch being furnished unless otherwise ordered. This tool is made for holding $\frac{1}{8}$, $\frac{5}{32}$, $\frac{3}{16}$, $\frac{7}{32}$, $\frac{1}{4}$ and $\frac{9}{32}$ inch drills. It is described as made of the best tool steel.

Combined Drill Holder and Countersink.

A Marquette, Mich., dispatch to the Cleveland *Plaindealer*, dated October 27, gives the following totals of ore shipments by the various ranges to date: Marquette range, 1,543,447 tons; Gogebic, 1,100,451 tons; Menominee, 926,190 tons; Vermillion, 368,385 tons; total, 3,938,473 tons.

Thompson's Clean Box Shoe Blacking.

The accompanying illustration represents a new style of blacking box which is used by the Thompson Mfg. Company, Lansingburgh, N. Y. In the cut the box is represented open with the lid resting upon it. In the form in which the box is made, it will be seen that it can be readily held in the hand while the fingers are protected from contact with the brush or blacking by the wide and flaring edge. The manufacturers also call attention to the fact that the box has rounding corners, thus permitting the removal of all blacking by the brush, as there are no sharp corners in which the blacking hardens out of reach. The point is also made that from the construction of the lid the box is easily opened without the annoyance that is often experienced from tight covers. The quality of the blacking is also alluded to. The simplicity, neatness, convenience and cleanliness of the box, together with the fact that it costs no more than the common flat box, are other points made in regard to it.

A New Blacking Box.

Royal Flint Ware.

George Havell, Newark, N. J., for whom Hibbard, Spencer, Bartlett & Co., Chicago, Ill., are agents, is manufacturer of a line of Royal Flint Ware, including a variety of culinary utensils, some of which are represented in the accompanying illustrations, from which a correct idea may be obtained of the style and special features of the goods. The ware is made of solid crockery, with metal bands for the purpose of attaching the necessary handles. The bottom of each utensil is protected with sheet iron, to which it is attached by means of a bead and groove in the earthenware, into which it is turned. There is an air space between the iron and the bottom of the vessel to prevent burning. Fig. 1 represents the Oxford saucepan, which is made in 1 1½, 2, 2½, 3½, 4½, 5½ quarts. Fig. 2, the Venice teapot, which is made in 1, 1½, 2, 3, 4 and 6 quarts, and Fig. 3, the Dresden Kettle, which is made in 1, 2, 3 and 5 quarts. The bright metal bands by which the handles are attached contrasting pleasantly with the color of the body of the utensils gives them an attractive appearance. The material of which these utensils are made is referred to as a composition possessing absolutely fire-proof qualities, and as only the china comes in contact with the food the desirability of these goods for culinary purposes is alluded to, while they are referred to as commended by their cleanliness, durability and attractiveness. It is expected that they will fill a place in the kitchen in competition with ordinary agate and granite ware for many purposes. Besides the articles illustrated Mr. Havell's circulars represent the Venice coffee pots, 1, 1½, 2, 3, 4 and 6 quarts; Royal pie plates, two sizes; Dresden saucepans, 1, 3 and 5 quarts; Royal pudding pans, 2, 3, 4 and 6 quarts; water coolers, 2, 3 and 6 gallons, Oxford preserving kettles, 1½, 2, 2½, 3½, 4½ and 5½ quarts; White House pails, 1, 2, 3 and 4 quarts, and White House jars or kettles, 1, 2, 3 and 4 quarts.

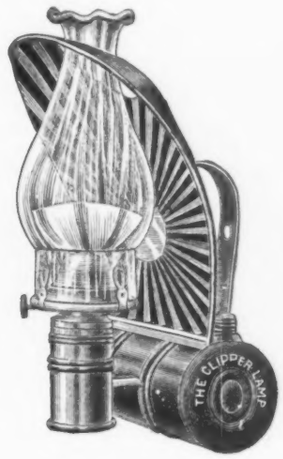
Fig. 1.—Oxford Sauce Pan.

Fig. 2.—Venice Tea Pot.

Fig. 3.—Dresden Kettle.

Clipper Lamp and Reflector.

The Clipper Mfg. Company, of Cincinnati, Ohio, are offering the trade the Clipper safety lamp, provided with their new style corrugated reflector, a general view



The Clipper Lamp.—Fig. 1.—Lamp Showing One Style of Corrugated Reflector.

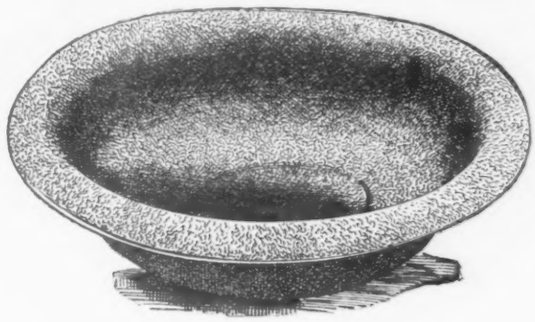
of which is afforded by the engraving Fig. 1. This lamp is specially designed for using coal oil as an illuminant and for employment in the kitchen, shop, store or factory. It is claimed to be perfectly safe and to give double the light of an ordinary household lamp. It is constructed of very heavy tin plate, which removes all danger of breakage. The special feature to which the company direct attention is the reflector, which is corrugated in such a manner as to greatly add to the power of the light. It is also arranged in such a way as to serve as a guard to the chimney, keeping it perfectly fast in place, while the handle acts as a bracket, by

Fig. 2.—The Clipper Queen Anne Lamp.

which the lamp may be suspended upon the wall or carried from place to place. The lamp is easily filled, cannot be broken and will not easily upset. Each lamp is thoroughly tested and is guaranteed not to leak if properly filled. Another form of lamp and reflector is shown in Fig. 2 of the accompanying illustrations. In this case the base or fount of the lamp is made of glass, rendering it free from leakage. The reflector is more nearly circular than the one above referred to and is placed in a slightly different position with regard to the lamp chimney. In the back of the handle is a match box, which will be found a great convenience. These goods are offered the trade in fancy colors, and are packed one dozen in a case.

Compressed Paper Wash-Basin.

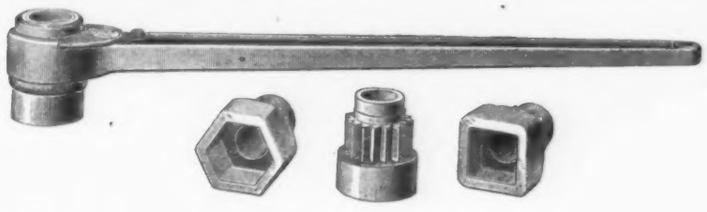
Hibbard, Spencer, Bartlett & Co., of Chicago, agents for Snelling & Matches, Newark, N. J., manufacturers, are putting on the market a line of unique wash-basins composed of paper, which has been compressed in the shape shown in the accompanying illustration. These basins are warranted thoroughly water-proof, will not crack or foul, and are handsomely decorated in six colors. The manufacturers announce that, while they guarantee them to be adapted to any climate, they will be found specially suitable for use in extremely hot countries where tin and other ware soon become useless. These basins are lighter than those made of tin or crockery and are besides more durable, being non-dentable, and non-breakable. Five sizes are made, the smallest being 11½ inches in diameter by 3 inches in hight, and the largest 15½ inches in diameter by 4 inches in hight.



Compressed Paper Wash Basins.

Steel Socket Bridge Wrench.

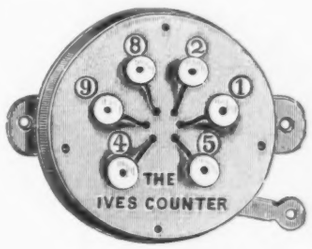
The illustration given below represents a new ratchet wrench designed for turning large nuts. It is manufactured by the Lowell Wrench Company, Lowell, Mass. The tool is so constructed that when once placed on the nut it is not necessary to take it off until the nut has been screwed up as far as desired, the turning being accomplished by the simple oscillation of the handle, as in the well-known ratchet drill. By moving the thumb-latch shown on top the same motion of the lever causes the wrench to turn the nut off instead of on. The point is made in regard to this wrench that it is especially compact and durable, and that the space occupied about the nut is comparatively small, allowing the use of the wrench in close places. The wrenches are made in three sizes, including sockets to take nuts from 1⅜ inches to 4½ inches in diameter, varying by eighths up to 2 inches, and then by ¼ inches. The tests to which this wrench has been subjected in practice have convinced the manufacturers that it will be found to meet a want for a tool of this character. The wrenches and sockets are made from steel castings, and are fully warranted. They are sold in this city by Manning, Maxwell & Moore, 111 Liberty street, New York.



Steel Socket Bridge Wrench.

The Ives Counter.

The accompanying illustration represents the Ives Counter, which is put on the market by George E. Ives, New Haven, Conn. It is intended to be attached to a press or other machine for registering its movements so as to give an accurate account of its productions and showing each operator's progress as often as may be desired. The diameter of the the face is 3⅜ inches, the entire width across face and projections being 4 1/16 inches. The thickness of the entire machine is 1½ inch and the weight 12 ounces. The lever moves ⅜ inch at the extreme end. The case is of brass, the works being iron and steel, except the faces of the dials which are card-



The Ives Counter.

board secured to brass. The machine may be instantly set at zero or any number desired, by means of a thumb-screw on face. In using the counter it is secured on some stationary part of the machine or near the machine, a wire or chain being attached to the lever, and the opposite end of the wire to the moving part of the machinery when it is ready for use. A single machine is sold at $4, lots of six at $3.50, and lots of one hundred or more at $2.25.

The last quarterly report of the Bureau of Statistics just issued contains, in a tabular form, the rates of import duties under the several tariff acts from 1789 to 1883, both inclusive, in four groups, from July 4, 1789, to February 5, 1816, from April 27, 1816, to August 30, 1842, from July 30, 1846, to June 21, 1874, and from June 22, 1874, to January 1, 1884.

The Eureka Drum.

We illustrate in the accompanying cuts a combined oven and heating drum, which is the invention of De Witt Van Evra, is manufactured and sold by Kieckhefer, Bartling & Co., 149 Lake street, Chicago. Fig. 1 shows the general appearance of the device with the end door closed. The drum is made with a sheet-iron body and cast-iron heads, oven bottoms, collars and doors. The sheet-iron body can be made of any length, so as to fit a long box stove

The Eureka Drum.—Fig. 1.—General Veew of Drum with Door Closed.

or an ordinary heating stove as may be found desirable or necessary. It can be used on the top of a stove to secure additional heat or to convert a heating stove into a cooking stove, or it can be placed in an upper room to heat it by utilizing the waste heat from a cooking or heating stove in the room below. The smoke and other products of combustion pass completely around the interior of this drum, being guided by deflecting plates which retain the heat but do not obstruct the draft. Fig. 2 of the illustrations shows the jacket of the drum partly cut away to expose the construction of the interior.

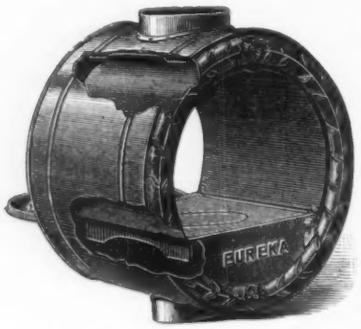
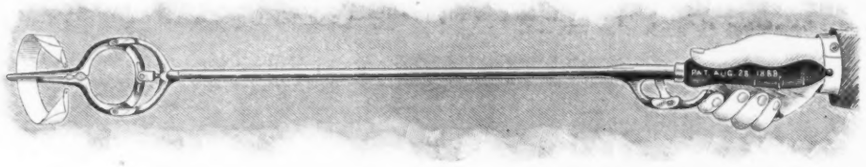


Fig. 2.—View of Drum with Side Partially Broken Away.

The doors are portable; when closed they convert the drum into an oven, but when it is not used as an oven they are intended to be taken off. They are also hung in such a manner as to form shelves when they are dropped down. By reference to Fig. 2 it will be seen that a cooking hole is provided on the inside of the drum, forming a convenient arrangement for heating water, irons, &c. The advantages of the Eureka drum, as stated by the inventor, are as follows: A heating stove can be converted into a parlor cook; a cheap high shelf and warming oven are secured, and a great convenience is provided for heating water, irons, &c., with a surface burner.

Champion Window Dresser.

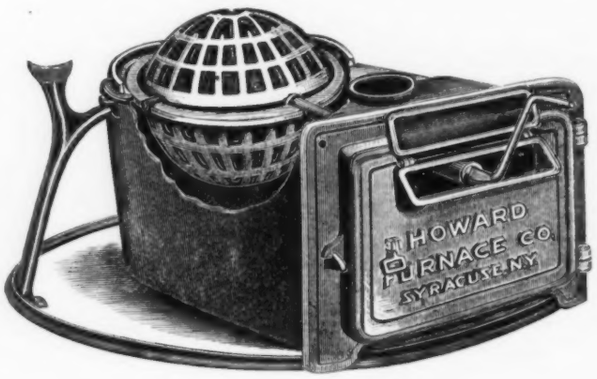
The attention which is being given to the appearance of show-windows at the present day is well known to all in the retail trade who have carefully read the columns of *The Iron Age* during the past year or two. It is also a well-recognized fact that, in order to maintatn an attractive display in the show-window, it is necessary to make frequent change in whole or in part of the goods which compose the exhibit. To do this with the greatest convenience is an object sought by all, and devices have been brought out for the purpose of assisting in this direction. Where the windows are high, the upper part of the display contained therein is usually composed of light articles which are placed in position by the assistance of a stepladder. This is inconvenient and annoying, and in order to obviate the use of such means and provide for a well-defined want in the retail trade, the Anderson & Krum Stationery Company, of this city, have brought out what is known as the George F. Hall Champion Window Dresser, a view of which is presented herewith. It is designed for use in moving light goods from one place to another on a shelf, line or bracket beyond the reach of a person's arm. It is convenient to handle and especially well fitted for dressing and arranging articles in a show-window. By means of the devise shown it is claimed that the user can from his position on the floor reach any point in a window, and can handle all articles therein with as much facility as if they were in reach of his arm. The device, as will be seen from the engraving, consists of a pair of prongs, which may be of various forms, operated by means of a rod extending down the hollow shaft to the handle. In the handle is a spring which is of sufficient tension to hold the prongs closed. By compressing the spring by means of the small handle shown in the cut at the left of the larger one the prongs are opened, releasing the article held between them. By allowing the handles to spring apart the prongs are again closed. The device is claimed to be cheap, durable, and not likely to get out of order. The stiffness of the spring may be regulated by means of a nut inside the handle. The dresser is 3 feet 8 inches in length, nickel-plated and provided with an ebonized handle.



Champion Window Dresser.

Howard Spherical Grate.

In the engraving presented herewith is sbown a general view of what is known as the Howard Patent Spherical Self-Dumping Anti-Clinker Grate, manufactured by the Howard Furnace Company, of Syracuse, N. Y. This grate is the invention of Mr. C. D. Howard, and represents the results of years of careful investigation and careful experiment. It is simple in construction, has no cog wheels or other complicated parts to warp or get out of order, and is arranged that it may be operated by a crank or upright lever as may be desired. As will be seen from an inspection of the engraving, the grate is spherical in form, thus presenting a large surface to the fire and therefore more air for combustion. The arrangement of parts is such that the grate cannot be left so as to burn out. Every time it is moved or partially revolved a new surface is presented, at the same time shaking and cleaning the fire perfectly. The parts are all strongly built and the grate is claimed to embody all the good points of other grates at present in use.



The Howard Spherical Grate.

The Philadelphia *Record* made an attack on the Bethlehem Iron Company, in which the assertion was made that the company paid $1,860,000 in dividends in seven years and put $1,200,000 of earnings into new plant. Joseph Wharton, in a letter to the *Press*, corrects the figures, making the dividends $1,740,000, and showing that the funds for new plant were raised by a mortgage.

CURRENT HARDWARE PRICES.

OCTOBER 31, 1888.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

Ammunition.

Caps, Percussion, ₩ 1000—
Hicks & Goldmark's
F. L. Waterproof, 1-10's ..... 50¢
E. B. Trimmed Edge, 1-10's ..... 65¢
E. B. Ground Edge, Central Fire, 1-10's. 70¢
Double Waterproof, 1-10's $1.40
Musket Waterproof, 1-10's ..... 50¢
G. D. ..... 28¢
S. B. ..... 30¢
} dis 25@25&7½

Union Metallic Cartridge Co.
F. C. Trimmed ..... 50¢
F. L. Ground ..... 65¢
Cen. Fire Ground ..... 70¢
Double Waterproof $1.40
Double Waterproof, in 1-10's $1.40
S. B. Genuine Imported ..... 45¢
Eley's E. B. ..... 54¢ @ 55¢
Eley s D Waterproof, Central Fire $1.60
} dis 25@25&7½

Cartridges—
Rim Fire Cartridges ..... dis 50&5&2 %
Rim Fire Military ..... dis 15&2 %
Central Fire, Pistol and Rifle ..... dis 25&5&2 %
Central Fire, Military & Sporting ... dis 15&5&2 %
Blank Cartridges, except 22 and 32 cal., an additional 10 % over above discounts.
Blank Cartridges .22 cal ..... $1.75, dis 2 %
Blank Cartridges, 32 cal ..... $3.50, dis 2 %
Primed Shells and Bullets ..... dis 15&5&2 %
B. B. Caps, Round Ball ..... $1.75, dis 2 %
B. B. Caps, Conical Ball, Swaged ..... $2.00, dis 2 %

Primers—
Berdan Primers all sizes, and B. L. Caps for Sturtevant Shells) ..... $1.00, dis 2 %
All other Primers, all sizes ..... $1.20 dis 2 %

Shells—
First quality, 4, 8, 10 and 12 gauge, dis 25&10&2 %
First quality, 14, 16 and 20 gauge ($10 list), dis 30&10&2 %
Star, Club, Rival and Climax Brands, } 10 gauge, $9 list } dis 32½
Star, Club, Rival and Climax Brands, } 12 gauge, $8 list } &10 2 %
Club, Rival and Climax Brands, 14, 16 and 20 gauge ..... dis 30&10&2 %
Selbold's Combination Shot Shells ..... dis 15&2 %
Brass shot Shells, 1st quality ..... dis 60&2 %
Brass Shot Shells, Club, Rival, Climax, dis 65&2 %
A. B. & C. Co., I. X. L., 10 & 12 gauge ... d's 40&5&2 %
A. B & C. Co ; "Special," 16 gauge .. dis 30&10&5&2 %
A. B. & C. Co.. "Special," 10 & 12 gauge ... 40&10&2 %
Fowler's Patent, 10 & 12 gange, ₩ 100 ..... $3.95
Small extras given by some dealers.

Shells Loaded—
List No. 19, 1887 ..... dis 20 & 10 %

Wads—
U. M. C. & W. R. A.—B. E., 11 up .. $2.00
U. M. C. & W. R. A.—B. E., 9&10 .. 3.30
U. M. C. & W. R. A.—B. E., 7&8 .... 2.60
U. M. C. & W. R. A.—P. E., 11 up. 3.10
U. M. C. & W. R. A—P. E., 9&10.. 4.00
U. M. C. & W. R. A.—P. E., 7&8 ... 490
} Dis 20&2 % With small extras.
Eley's B. E., 11 up $1.75
Eley's P. E., 11 @ 20 ..... $2.80

Anvils.—Eagle Anvils .... ₩ ₺ 10¢, dis 20 @ 20&5 %
Peter Wright's ..... 9½¢
Armitage's Mouse Hole ..... 8½¢
Armitage Mouse Hole, Extra .. 11¼@11½¢
Trenton ..... 9½¢@9½¢
Wilkinson's ..... 9½¢@10¢
J. & Riley Carr, Patent Solid ..... 11@11½¢

Anvil Vise and Drill—
Millers Falls Co ..... $18.00, dis 20 %
Chenev Anvil and Vise ..... dis 25 %
Allen Combined Anvil and Vise ..... $5, dis 40&10 %
Moore & Barnes Mfg. Co ..... dis 33½ %

Apple Parers.

Advance	₩ doz. $4.75
Antrim Combination	₩ doz. 5.50
Baldwin	₩ doz. 5.25
Champion	₩ doz. 7.25
Eureka, 1888	each 17c0
Family Bay State	₩ doz. 12.00
Gem	₩ doz. 5.25
Gold Medal	₩ doz. 4.00
Hudson's New '88	₩ doz. 3.75
Ideal	₩ doz. 4.75
Improved Bay State	₩ doz. 30 00
Little Star	₩ doz. 5.00
Monarch	₩ doz. 13.50
New Lightning	₩ doz. 5.50
Oriole	₩ doz. 4.00
Penn	₩ doz. 4.00
Perfection	₩ doz. 4.00
Pomona	₩ doz. 4 00
Rocking Table	₩ doz. 6.00
Turntable	₩ doz. 4.50
Victor	₩ doz. 13.50
Waverly	₩ doz. 4.50
White Mountain	₩ doz. 4.50
72	₩ doz. 4.25
76	₩ doz. 5.75
78	₩ doz. 6.50

Augers and Bits.

Douglass Mfg. Co. }
Wm. A. Ives & Co. } ..... dis 70 %
Humphreysville Mfg. Co. }
French, Swift & Co. (F. H. Beecher) }
New Haven Copper Co ..... dis 60&10&10 %
Cook's, Douglass Mfg. Co ..... dis 50 %
Cook's, New Haven Copper Co ... dis 50&10&50&10&5 %
Ives' Circular Lip ..... dis 60 %
Patent Solid Head ..... dis 30 %
C. E. Jennings & Co., No. 10, extension l'p ..... dis 40 %
C. E. Jennings & Co., No. 30 ..... dis 60 %
C. E. Jennings & Co., Auger Bits, in fancy boxes, ₩ set, 32¼ quarters, No 5, $5; No. 3C, $3 ..... dis 20 %
Lewis' Patent Single Twist ..... dis 45 %
Russell Jennings' Augers and Bits ..... dis 25 %
Imitation Jennings' Bits (new list) ..... dis 60@65&5 %
Pugh's Black ..... dis 20 %
Car Bits ..... dis 50&10&60 %
L'Hommedieu Car Bits ..... dis 15&10 %
Forstner Pat. Auger Bits ..... dis 10 %

Screw Augers—
Ives }
French, Swift & Co. } ..... dis 25&10 @ 25&10&5 %
Douglass' }
Bonney's Adjustable ₩ doz. $48 ..... dis 40&10 %
Stearns' ..... dis 20&10 %
Ives' Expansive, each $4.50 ..... dis 50&10 %
Universal Expansive, each $4.50 ..... dis 20 %
Wood's ..... dis 25 @ 25&10 %

Expansive Bits—
Clark's small, $18; large, $36 ..... dis 35 @ 35&5 %
Ives' No. 4, per doz., $60 ..... dis 35 @ 40 %
Swan's ..... dis 40 %
Steer's, No. 1, $26; No. 2, $22 ..... dis 35 %
Stearns' No. 2, $48 ..... dis 20 %

Nimlet Bits—
Common ..... ₩ gross $2.75 @ $3.25
Diamond ..... ₩ doz. $1.10, dis 25&10 %
"Bee" ..... dis 25 @ 25&5 %
Double Cut, Shepardson's ..... dis 45 @ 45&5 %
Double Cut, Ct. Valley Mfg. Co ..... dis 30&10 %
Double Cut, Hartwell's, ₩ gro. $5.25
Double Cut, Douglass' ..... dis 40&10 %
Double Cut, Ives' ..... dis 60 @ 60&5 %

Nit Stock Drills—
Morse Twist Drills ..... dis 50&10&5 %
Standard ..... dis 50&10&5 %
Cleveland ..... dis 50&10&5 %
Syracuse, for metal ..... dis 50&10&5 %
Syracuse, for wood (wood list) ..... dis 30 @ 30&5 %
Williams' or Holt's, for metal. ..... dis 50&10&10 %
Williams' or Holt's, for wood ..... dis 40&10 %

Ship Augers and Bits—
L'Hommedieu's ..... dis 15&10 %
Watrous's ..... dis 15&10 %
Snell's ..... dis 15&10 %
Snell's Ship Auger Patt'n Car Bits, dis 15&10 %
} Extras often given.

Awl Halts.
Sewing, Brass Ferrule ..... $3.50 ₩ gross—dis 45&10 %
Patent Sewing, Short ..... $1.00 ₩ doz—dis 40&10 %
Patent Sewing, Long ..... $1.20 ₩ doz.—net
Patent Peg, Plain Top ..... $10.00 ₩ gross—dis 45&10 %
Patent Peg, Leather Top ... $12.00 ₩ gross—dis 45&10 %

Awls, Brad Sets, &c.
Awls, Sewing, Common ..... ₩ gross $1.70—dis 35 %
Awls, Shouldered Peg ... ₩ gross $2.45—dis 40@40&10 %
Awls, Patent Peg ..... ₩ gross 65¢—dis 40@40&10 %
Awls, Shouldered Brad ..... $2.70 ₩ gross—dis 35 %
Awls, Handled Brad ..... $7.50 ₩ gross—dis 45 %
Awls, Handled Scratch ..... $7.50 ₩ gross—dis 35&10 %
Awls, Socket Scratch ..... $1.50 ₩ doz—dis 25 @ 30 %

Awl and Tool Sets.
Aiken's Sets, Awls & Tools, No. 20, ₩ doz. $10—dis 55&10 %
Gray's Ad Tool Hdls., Nos. 1, $12; 2, $18.; 3, $12; 4, $9. dis 25@25&10 %
Miller's Falls Adj. Tool Hdls., Nos. 1, $12; 2, $18. dis 25 %
Henry's Combination Haft ..... ₩ doz. $9
Brad Sets, No. 42, $10.50, No. 43, $12.50 ... dis 70&10&5 %
Brad Sets, Stanley's Excelsior, No. 1, $7.50, }
Brad Sets, Stanley's Excelsior, No. 2, $4.00, } dis 30&10 %
Brad Sets, Stanley's Excelsior, No. 3, $5.50, }

Axes.
Makers' and Special Brands—
First quality ..... ₩ doz. $6.00 @ $6.50
Others ..... ₩ doz. $5.50 @ $5.75

Axle Grease.
Fraser's, in bulk ..... Keg ₩ ₺, 4¢; Pail, ₩ ₺, 5¢ net
Frasers, in boxes ..... ₩ gross $9.50
Dixon's Everlasting, in bxs., ₩ doz., 1 ₺ : $1.20 ; 2 ₺, $2
Dixon's Everlasting ..... 10-₺ pails, each, 85¢
Lower grades, special brands ..... ₩ gro $5.50 @ $7

Axles.—No. 1, 4¢ @ 4¼¢; No. 2, 5¼ @ 5½¢.
Nos. 7 to 15 ..... dis 50@55 %
Nos. 19 to 22 ..... dis 60&10&10@70 %
National Wrought Steel Tubular Self-Oiling :
Standard Farm (1 to 5) and Special Farm (A1 to A5)
Less than 10 sets ..... dis 33⅓ %
Over 10 sets ..... dis 33⅓&5 %
X Strong Exp. (6 to 9), & XX Strong Truck (10 to 16):
Less than 10 sets ..... dis 10 %
Over 10 sets .. .. dis 10&5 %

Bag Holders.
Sprengle's Pat., ₩ doz $18. ..... dis 60 %
Balances.—Spring Balances ..... dis 50 %
Common 24 ₺ ..... ₩ doz., $1.50—dis 50 %
Chatillon's Spring Balances ..... dis 50 %
Chatillon's Circular Spring Balances ..... dis 60 %

Bells.
Hand—
Light Brass ..... dis 70&10 %
Extra Heavy ..... dis 60&10 %
White Metal ..... dis 60&10&10 %
Silver Chime ..... dis 33⅓&10 %
Globe (Cone's Patent) ..... dis 25&10 @ 35 %

Door—
Gong, Abbe's ..... dis 33⅓&10 %
Gong, Yankee ..... dis 45&10 %
Gong, Barton's ..... dis 40&10 @ 50 %
Crank, Taylor's ..... dis 25&10 %
Crank, Brooks' ..... dis 50&10&2 %
Crank, Cone's ..... dis 10 %
Crank, Connell's ..... dis 20&10 %
Lever, Sargent's ..... dis 60&10 %
Lever, Taylor's Bronzed or Plated ..... net
Lever, Taylor's Japanned ..... dis 25&10 %
Lever, R. E. ₩ Co's ..... dis 50&10&2 %
Pull, Brook's ..... dis 50&10&2 %
Pull Western ..... dis 25&10 %

Cow—
Common Wrought ..... dis 60&10 %
Western ..... dis 20&10 %
Western, Sargent's list ..... dis 70&10 %
Kentucky "Star" ..... dis 20&10 %
Kentucky, Sargent's list ..... dis 70&10 %
Dodge, Genuine Kentucky, new list ..dis 70@70&10 %
Texas Star ..... dis 50&10 @ 50&10&5 %
Call ..... dis 40@40&5 %
Farm Bells ..... ₩ ₺, 3¢ @ 3½¢
Steel Alloy Church and School Bells ..... dis 40 %

Bellows.—Blacksmiths' ..... dis 60&10&5 @ 60 %
Molders' ..... dis 40 @ 40&10 %
Hand Bellows ..... dis 40&10 @ 50 %

Belting, Rubber.
Common Standard ..... dis 70&10 %
Standard ..... dis 70&70&10 %
Extra ..... dis 60&5 @ 60&10
N. Y. R. & P. Co., Standard ..... dis 60&5 %
N. Y. R. & P Co., Extra Standard ..... dis 50&10 %

Bench Stops.
Morrill's ..... ₩ doz $9—dis 50 %
Hotchkiss's ..... ₩ doz $5.00—dis 10 @ 10&10 %
Weston's, per doz No. 1, $10 : No. 2, $9 ... dis 25&10&5 %
McGill's ..... ₩ doz $3—dis 10 %

Bits.—Auger, Gimlet Bit Stock, Drills, &c., see Augers and Bits.

Bit Holders.
Extension, Barber's .... ₩ doz $15.00—dis 40 @ 40&10 %
Extension, Ives' ..... ₩ doz $20.00—dis 60&5 @ 60&10 %
Diagonal ..... ₩ doz $24.00—dis 40 %
Angular ..... ₩ doz $24.00—dis 40&5 %

Blind Adjusters.
Domestic ..... ₩ per doz $3.00—dis 33⅓ %
Excelsior ..... ₩ doz $10.00—dis 50&10&2 %
Washburn's Self-Locking .. .. dis 20 @ 20&10 %

Blind Fasteners.
Mackrell's ..... ₩ doz pairs, $1.00—dis 20@20&10 %
Van Sand's Screw Pattern ..... $15 ₩ gro.—dis 60&10 %
Van Sand's Old Pattern ..... $15 ₩ gro.—dis 55&10 %
Washburn's Old Pattern ..... ₩ ₩ gro. net
Merriman's ..... new list, net
Austin & Eddy, No. 2008 ..... ₩ ₩ gro. net
Security Gravity ..... ₩ ₩ gro. net

Blind Staples.
Barbed, ½ in. and larger ..... ₩ ₺ 7¼ @ 8¢ net
Barbed, ⅝ in ..... ₩ ₺ 8¼ @ 9¢ net

Blocks.
Cleveland Block Co., Mal. Iron ..... dis 50 %
Novelty Tackle Blocks, Mal. Iron ..... dis 50 %

Bolts.
Door and Shutter—
Cast Iron Barrel, Square, &c ..... dis 70 @ 70&10 %
Cast Iron Shutter Bolts ..... dis 70 @ 70&10 %
Cast Iron Chain (Sargent's list) ..... dis 65&10 %
Ives' Patent Door Bolts ..... dis 60 %
Wrought Barrel ..... dis 70 @ 70&10 %
Wrought Square ..... dis 70 @ 70&10 %
Wr't Shutter, all Iron, Stanley's list ..... dis 60&10 %
Wr't Shutter, Brass Knob, Stanley's ..... dis 40&10 %
Wrought Shutter, Sargent's list ..... dis 60&10 %
Wrought Sunk Flush, Sargent's list ..... dis 55&10 %
Wrought Sunk Flush, Stanley's list ..... dis 50&10 %
Wrought B.K. Flush, Com'n Stanley's list, dis 55&10 %

Carriage—
Com. list June 10, '84 ..... dis 75&2½&2 %
Genuine Eagle, list Oct., '84 ..... dis 75&10 %
Phila. pattern, list Oct. 7, 84 ... dis 75&10@75&10&5 %
R. B. & W . old list ..... dis 70 %

Tire—
Common, list Feb. 28, 1883 ..... dis 70 %
P. C. B. & N. Co., Empire, list Feb. 28, 1883 ..... dis 70 %
P. C. B. & N. Co., Philadel., list Oct. 84. ... dis 82½ %
P.C.B.&N.Co., Keystone, Phil. list, Oct. '84 ..... dis 80 %
P.C.B.&N.Co., Norway, Phil. list, Oct. '84. dis 75&10 %
Am. S. Co., Norway, Phil., list Oct. 16, '84 .. dis 75&10 %
Am. S. Co., Eagle, Phil., list Oct. 16, '84 ..... dis 80 %
Am. S. Co., Philadel. list, Oct. 16, 84 ..... dis 82½ %
Am. S. Co., Bay State, list Feb. 28, '83 ..... dis 70 %
R. B. & W., Philadel. list Oct. 16, 1884 ..... dis 82 %
R. & E. Mfg. Co ..... dis 70 %

Stove and Plow—
Stove ..... dis 62½ %
Plow ..... dis 60&5 %
Am. S. Co. Stove, Annealed ..... dis 62½ %
R. B. & W., Plow ..... dis 55 %
R. B. & W., Stove ..... dis 62½ %
R. & E. Mfg Co., Stove ..... dis 62½ %
Machine, according to size ..... dis 75&10 @ 80 %
Bolt Ends, according to size ..... dis 75&10 @ 80 %

Borax ..... ₩ ₺ 9¾@10¼¢

Boring Machines.

Without Augers.	Upright.	Angular.
Douglas	$5.50	$6.75.....dis 50 %
Snell's, Rice's Patent	5.50	6.75.dis 40&10&10 %
Jennings	5.50	6.75..dis 45@45&10%
Other Machines	2.35	2.75 .....net
Phillips' Pat., with Augers	7.00	7.50 .....net

Bow Pins
Humason, Beckley & Co.'s ..... dis 60&10 %
Sargent & Co.'s ..... $17 and $18, dis 60&10 %
Peck, Stow & W. Co ..... dis 50&10 @ 50&10&5 %

Braces.
Backus, Nos. 110 to 114 and 31 to 33 .. dis 60&5@60&10%
Backus, Nos. 6, 8, 12, 14 ..... dis 60&10&5 %
Backus, Nos. 16, 18, 20, 29, 7 9, 11 ..... dis 70&10&5 %
Barber's, Nos. 10 to 16 ..... dis 50 %
Barber's, Nos. 30 to 33 ..... dis 50 %
Barber's, Nos. 40 to 63 ..... dis 50&10 %
Barker's, Nos. 8, 10 and 12 ..... dis 75&10@80 %
Barker's, Plated, Nos. 8, 10 and 12 ..... dis 65&10@70 %
Osgood's Ratchet ..... dis 40&10@50 %
Spofford's ..... dis 50&10 %
Ives' New Haven Novelty ..... dis 70 @ 70&5 %
Ives' New Haven Ratchet ..... dis 60&5 @ 60&10 %
Ives' Barber Ratchet ..... dis 60&5 @ 60&10 %
Ives' Barbers ..... dis 60&5 @ 60&10 %
Ives' Spofford ..... dis 60&5 @ 60&10 %
Common Ball, American ..... $1.10 @ $1.15
Bartholomew's, Nos. 25, 27, 30 ..... dis 50&10@60&5 %
Bartholomew's, Nos. 117 118 119 ..... dis 70 @ 70&5 %
Amidon's Barker's Imp'd Pla'n ..... dis 75&10 @ 80 %
Amidon's Barker's Imp. Nickeled ..... dis 65&10 @ 70 %
Amidon's Ratchet ..... dis 75&10 @ 80 %
Amidon's Eclipse Ratchet ..... dis 60 %
Amidon's Globe Jawed ..... dis 40&40&10 %
Amidon's Corner Brace ..... dis 40 @ 40&10 %
Amidon's Universal ..... 8 in., $2.10 ; 10 in., $2.25
Amidon's Buffalo Ball ..... $1.10 @ $1.15
P. S. & W ..... dis 50&10 %

Brackets.
Shelf, plain, Sargent's list ..... dis 55&10 @ 55&10&10 %
Shelf, fancy, Sargent's list ..... dis 60&10 @ 60&10&10 %
Reading, plain ..... dis 60&10 @ 60&10&5 %
Reading, Rosette ..... dis 60&10 @ 60&10&10 %

Bright Wire Goods ..... dis 87½ @ 87½&10 %

Broilers.

Inch.	₩ 10	₩ x 11
Per doz.	$4.50	5.50 6.50

Buckets.—See Well Buckets and Pails.

Bull Rings.—Union Co. Nut ..... dis 55 %
Sargent's ..... dis 60½&10 @ 70&5 %
Hotchkiss' low list ..... dis 30 %
Humason, Beckley & Co.'s ..... dis 70 %
Peck, Stow & W. Co.'s ..... dis 50&10 @ 50&10&10 %
Ellrich Hdw. Co., White Metal, low list. dis 50@50&10 %

Butcher's Cleavers.
Bradley's ..... dis 25 @ 30
L. & I. J. White ..... dis 20&5¢
Beatty's ..... dis 40 @ 40&5¢

1	2	3	4	5	6	7	8
$16.50	19.00	21.50	24.00	27.00	30.00	33.50	36.50

New Haven Edge Tool Co.'s ..... dis 40 %
P. S. & W ..... dis 33⅓&5@33⅓&10 %

Butts.
Brass—
Wrought Brass ..... dis 70@70&10 %
Cast Brass, Tiebout's ..... dis 33⅓ %
Cast Brass, Corbin's Fast ..... dis 33⅓&10 %
Cast Brass, Loose Joint ..... dis 33⅓&10 %

Cast Iron—
Fast Joint, Narrow ..... dis 50&10 %
Fast Joint, Broad ..... dis 55&10 %
Loose Joint ..... }
Loose Joint, Japanned ..... }
Loose Joint, Jap. with Acorns ..... }
Parliament Butts ..... } ....dis 70&10
Mayer's Hinges ..... }
Loose Pin, Acorns ..... }
Loose Pin, Acorns, Japanned ..... }
Loose Pin, Acorns, Jap, Pltd. Tips ..... }

Wrought Steel—
Fast Joint Narrow....dis 70&10 %
Fast Joint, Lt. Narrow....dis 70&10 %
Fast Joint, Broad....dis 70&10 %
Loose Joint, Broad....dis 70&10 %
Table Butts, Back Flaps, &c....dis 70&10 %
Inside Blind, Regular....dis 70&10 %
Inside Blind, Light....dis 70&10 %
Loose Pin....dis 70&10 %
Bronzed Wrought Butts....dis 40&10@40&10&5 %

Calipers.—See Compasses.

Calks, Toe

Gautier....₩ lb 5½@6¢
Dewicks....₩ lb 5½@6¢

Can Openers.

Messenger's Comet....₩ doz $3.00, dis 25 %
American....₩ gross $3.00
Duplex....₩ doz 25¢, dis 15 @ 20 %
Lyman's....₩ doz $3.75, dis 20 %
No. 4, French....₩ doz $2.25, dis 55 @ 60 %
No. 5, Iron handle....₩ gross $6.00, dis 45 @ 50 %
Eureka....₩ doz $2.50, dis 10 %
Sardine Scissors....₩ doz $2.75@$3.00 %
Star....₩ doz $2.75 %
Sprague, No. 1, $?; ?, $2.25; ?, $2.50....dis 50&10&10 %
World's Best, ₩ gross, No. 1, $12.00; No. 2, $24.00, No. 3, $36.00....dis 50&10 %
Universal....₩ doz $3.00, dis 35&5 %
Domestic....₩ doz $2.50, dis 45 %
Champion....₩ doz $2.00, dis 50 %

Cards.

Horse and Curry....dis 10&10 @ 10&10&10 %
Cotton....New list, Aug., 1883, dis 10 @ 10&10 %
Wool.... " " " dis 10 @ 10&10 %

Carpet Stretchers.

Cast Steel, Polished....₩ doz $2.25
Cast Iron, Steel Points....₩ doz 80¢
Socket....₩ doz $1.75
Bullard's....dis 25 @ 25&10 %

Carpet Sweepers.

Bissell No. 5....₩ doz $17.00
Bissell No. 7 New Drop Pan....₩ doz $19.00
Bissell Grand....₩ doz $36 00
Grand Rapids....₩ doz $24.00
Crown Jewel....No. 1, $18; No. 2, $19; No. 3, $20
Magic....₩ doz $15.00
Jewel....₩ doz $17.00
Improved Parlor Queen, Nickeled Trimmings....₩ doz $27.00
Improved Parlor Queen, Japanned Trimmings....₩ doz $24.00
Excelsior....₩ doz $22.00
Garland....₩ doz $18.00
Parlor Queen....₩ doz $24.00
Housewife's Delight....₩ doz $15.00
Queen....₩ doz $16.00
Queen, with band....₩ doz $18.00
King....₩ doz $30.60
Weed Improved....₩ doz $18.00
Hub....₩ doz $16.00
Cog Wheel....₩ doz $16.00

Cartridges.—See Ammunition.

Casters.

Bed, Plate, Shallow Socket, Deep Socket....New list; Brass...dis 55 @ 55&5 %; Others...dis 60 @ 60&5 %; 40&10 %
Yale Casters, list May, 1884....dis 30&10&40 %
Yale, Gem....dis 60@60&5 %
Martin's Patent (Phœnix)....dis 45&10 @ 50 %
Payson's Anti-friction....dis 60 @ 60&10 %
"Giant" Truck Casters....dis 10 @ 10&5 %
Stationary Truck Casters....dis 45&10

Cattle Leaders.

Humason, Beckley & Co.'s....dis 70 %
Sargent's....dis 66⅔&10 %
Hotchkiss....dis 30 %
Peck Stow & W. Co....dis 50&10 %

Chain.

Trace, 6½-10-2, exact sizes, ₩ pair, $1.03; Trace, 6½-10-3, exact sizes, ₩ pair, .92; Trace 7-10-2, exact sizes...₩ pair, 1.11....dis 50&10@50&10&5 %

NOTE.—Traces, "Regular" sizes 3¢ per ₩ pair less than exact.

Log, Fifth, Stretcher, and other fancy Chains, list Nov. 1, 1884....dis 50&10 @ 50&10&5 %
American Coil 3-16 ¼ 5-16 ⅜ 7-16 ½ ⅝ ¾
In cask lots. 8.75 6.25 5.00 4.50 4.40 4.00 3.75 3.50
Less than cask lots, add ½¢@½¢ ₩ lb.
German Coil, list of June 20, 1887....dis 50&10&5@60 %
Ger. Halter Chain, list of June 20, 1887....dis 50&10&5@60 %
Covert Halter, Hitching and Breast....dis 50&2 %
Covert Traces....dis 35@2 %
Oneida Halter Chain....dis 60 @ 60&5 %
Galvanized Pump Chain....₩ lb 5½¢ @ 6¢
Jack Chain, Iron....dis 70&10 @ 75 %
Jack Chain, Brass....dis 65 @ 70 %

Chalk.—White.

....₩ gro 50¢
Red....₩ gro 70¢
Blue....₩ gro 8"¢
White Crayons....₩ gro 12¢ @ 12½ dis 10¢

Chalk Lines.—See Lines.

Chisels.

Socket Framing and Firmer—
P., S. & W., New Haven and Middlesex, Mix, Ohio Tool Co....dis 75&5 @ 75&10 %
Buck Bros....dis 30 %
Merrill....dis 60&10@60&10&5 %
L. & I. J. White....dis 30 @ 30&5 %
Witherby and Douglass....dis 75 @ 75&5 %
Tanged Firmers....dis 40&10 %
Tanged Firmers, Butcher's....$4.75 @ $5.00
Tanged Firmers, Spear & Jackson's....$5.00 to £
Tanged Firmers, Buck Bros....dis 30 %
Cold Chisels, ₩ lb....16¢ @ 19¢

Chucks.

Beach Patent....each, $8.00, dis 20 %
Morse's Adjustable....each, $7.00, dis 20 @ 20&5 %
Danbury....each, $6.00, dis 30 @ 30&5 %
Syracuse, Bals Pat....dis 25 %

Clamps.

Providence Tool Co.'s Wrought Iron....dis 25 %
Adjustable, Gray's....dis 20 %
Adjustable, Lambert's....dis 20 %
Adjustable, Snow's....dis 40&5 %
Adjustable, Hammer's....dis 15 %
Adjustable, Stearns'....dis 20&10 %
Stearns' Adjustable Cabinet and Corner....dis 20&10 %
Cabinet, Sargent's....dis 66⅔&10 %
Carriage Makers', Sargent's....dis 70&10 %
Ebernard Mfg. Co....dis 40&5 @ 40&10 %
Warner's....dis 40&10 @ 40&10&5 %
Sew Clamps....See Vises

Clips.

Norway, Axle, ¼ & 5-16....dis 55&5&5
Second grade Norway Axle, ¼ & 5-16....dis 65&5
Superior Axle Clips....dis 66⅔&5 @ 66⅔&5&5 %
Norway Spring Bar Clips, 5-16....dis 60&5&5
Wrought-Iron Felloe Clips....₩ lb 5½¢
Steel Felloe Clips....₩ lb 5¢
Baker Axle Clips....dis 25 %

Cockeyes.

....dis 50 %

Cocks, Brass.—Hardware list....dis 40&10&2 %

Coffee Mills

Box and Side, List revised Jan. ", 1888....dis 50&2 %
American, Enterprise Mfg. Co....dis 20&10@30 %
The "Swift," Lane Bros....dis 20&10 %

Compasses, Dividers, &c.

Compasses, Calipers, Dividers....dis 70@70&10 %
Gemis & Call Co.'s Dividers....dis 60&5 %
Gemis & Call Co.'s Compasses & Calipers....dis 50&5 %
Gemis & Call Co.'s Wing & Inside or Outside....dis 50&5 %
Gemis & Call Co.'s Double....dis 60 %
Gemis & Call Co.'s (Call's Patent Inside)....dis 30 %
Excelsior....dis 50 %
Stevens & Co.'s Calipers and Dividers....dis 25&10 %
Starrett's Spring Calipers and Dividers.dis 25&10&.0 %
Starrett's Lock Calipers and Dividers....dis 25 x 1⁰ %
Starrett's Combination Dividers....dis 25&10 %

Coopers' Tools.

Bradley's....dis 20 %
Barton's....dis 20@20&5 %
L. & I. J. White....dis 20@25 %
Albertson Mfg. Co....dis 25 %
Beatty's....dis 40 @ 40&5 %
Sandusky Tool Co....dis 30 @ 30&5 %

Corkscrews.

Humason & Beckley Mfg. Co....dis 40 @ 40&10 %
Clough's Patent....dis 33⅓ @ 33⅓&5 %
Howe Bros. & Hulbert....dis 35 %

Corn Knives and Cutters.

Bradley's....dis 10 %
Wadsworth's....dis 25 %

Cradles.—Grain....dis 50&2 %

Crow Bars.—Cast Steel....₩ lb 4¢
Iron, Steel Points....₩ lb 3½¢

Curry Combs.

Fitch's....dis 50&10 @ 50&10&10 %
Rubber....₩ doz $10.00, dis 20 %
Perfect....dis %

Curtain Pins.—Silvered Glass....net
White Enamel....net

Cutlery.

Beaver Falls and Booth's....dis 33⅓ %
Wostenholme....$7.75 to £

Dampers, &c.

Dampers, Buffalo....dis 50 %
Buffalo Damper Clips....dis 50 %
Crown Damper....dis 40 %
Excelsior....dis 40&10 %

Dividers.—See Compasses.

Dog Collars.

Embossed Gilt, Pope & Stevens' list....dis 30&10 %
Leather, Pope & Stevens' list....dis 40 %
Brass, Pope & Stevens' list....dis 40 %

Door Springs.

Torrey's Rod, regular size....₩ doz $1.30
Gray's....₩ gro, $20.00, dis 20 %
Bee Rod....₩ gro, $20.00, dis 20 %
Warner's No. 1, ₩ doz, $2.50; No. 2, $3.30, dis 40&10@50 %
Gem (Coil), list April 19, 1886....dis 10 %
Star (Coil), list April 19, 1886....dis 20 %
Victor (Coil)....dis 60 @ 60&10 %
Champion (Coil)....dis 60&10 @ 60&10&10 %
Philadelphia....5 in., $5.00; 8 in., $7.75, dis 30 %
Cowell's....No. 1, ₩ doz $18.00; No. 2, $15.00, dis 50 %
Rubber, complete....₩ doz $4.50, dis 55&10 %
Hercules....dis 50 %
Shaw Door Check and Spring....dis 25 @ 30 @ 35 %
Elliott's Door Check and Spring....dis 25 %

Drawing Knives.

P., S. & W., Mix, New Haven and Middlesex....dis 75&5 @ 75&10 %
Merrill....dis 60&10&10 %
Witherby and Douglass....dis 75@75&5 %
Watrous....dis 15&10 @ 25 %
L. & I. J. White....dis 20&25 %
Bradley's....dis 35 %
Adjustable Handle....dis 25 @ 33⅓ %
Wilkinson's Folding....dis 25 @ 25&5 %

Drills and Drill Stocks.

Blacksmiths'....each, $1.75
Blacksmiths' Self-Feeding....each, $7.50, dis 20 %
Breast, P. S. & W....dis 40&10 %
Breast, Wilson's....dis 30&5 %
Breast, Millers Falls....each, $3.00 dis 25 %
Breast, Bartholomew's...each, $2.50, dis 25&10 @ 40 %
Ratchet, Merrill's....dis 20 @ 20 & 5 %
Ratchet, Ingersoll's....dis 25 %
Ratchet, Parker's....dis 30 @ 20&5 %
Ratchet, Whitney's....dis 30&10 %
Ratchet, Weston's....dis 20@25 %
Ratchet, Moore's Triple Action....dis 25 @ 30 %
Whitney's Hand Drill, Plain, $11.00, Adjustable, $12.00....dis 20&10 %
Wilson's Drill Stocks....dis 1⁰ %
Automatic Boring Tools....each, $1.75 @ $1.65

Twist Drills—
Morse....dis 50&10&5 %
Standard....dis 50&10&5 %
Syracuse....dis 50&10&5 %
Cleveland....dis 50&10&5 %
Williams....dis 50&10&10 %

Drill Bits.—See Augers and Bits.

Drill Chucks.—See Chucks.

Dripping Pans.—Small sizes....₩ lb 6¾¢
Large sizes....₩ lb 6¾ ¢

Egg Beaters.

Dover....₩ doz., $2.00
National....₩ doz $4.50, dis 33⅓ %
Family (T. & S. Mfg. Co.)....₩ gro, $17.00@$18.00
Kingston (Standard Co.)....₩ gro, $6.50
Acme (Standard Co.)....₩ gro, $6.00
Duplex (Standard Co.)....₩ gro, $15.00
Duplex, extra heavy....₩ doz extra $5.00
Rival (Standard Co.)....₩ gro. $.2.00
Triumph (T. & S. Mfg. Co.)....₩ gro, 10.50@$11.50
Advance No. 1....₩ gro $10.50
Advance, No. 2....₩ gro $10.00
Bryant's....₩ gro $15.00
Ayres' Spiral....₩ gro $5
Double Hamblin & Russell Mfg Co.)....₩ gro, $16.20
Easy (Hamblin & Russell Mfg. Co.)....₩ gro, $14.00
Triple (Hamblin & Russell Mfg. Co.)....₩ gro, $16.20
Spiral (Hamblin & Russell Mfg. Co.)....₩ gro, $4.50
Paine, Diehl & Co's....₩ gro $24.00

Egg Poachers.

Buffalo Steam Egg Poachers, ₩ doz., No. 1, $6 00; No. 2, $9.00....dis 25 %

Electric Bell Sets.—Wollensak's....dis 15 %

Bigelow & Dowse....dis 20 %

Emery.

	No. 4 to 46 gr.	No. 54 to 150 gr.	Flour, CF & FF.
Kegs, ₩ lb	4 ¢	5 ¢	2½¢
½ kegs, ₩ lb	4½¢	5½¢	2¾¢
¼ kegs, ₩ lb	4¾¢	5¾¢	3 ¢
10-lb cans, 10 in case	6 ¢	6½¢	5 ¢
10-lb cans, less than 10	10 ¢	10 ¢	7½¢

Enameled and Tinned Ware.—See Hollow-Ware.

Escutcheon Pins.

Iron, list Nov. 11, 1885....dis 50&10 @ 50&10&5
Brass....dis 60 @ 60&5 %

Escutcheons.

Door Lock....Same discounts as Door Locks
Brass Thread....dis 60 @ 60&10 %
Wood....dis 25 %

Faucets.

Fenn's....dis 40 %
Bohren's Patent Rubber Ball....dis 25 %
Fenn's Cork Stops....dis 33⅓ %
Star....dis 60 %
Frary's Patent Petroleum....dis 40&5&2 %
West's Patent Key....dis 50&10 %
Anchor Lock....dis 45 %
Metallic Key, Leather Lined...dis 60&10 @ 60&10&10 %
Cork Lined....dis 70&5 @ 70&10 %
Burnside's Red Cedar....dis 50 %
Burnside's Red Cedar, bbl. lots....dis 50&10 %
J. Sommer's Peerless Best Block Tin Key....dis 40 %
J. Sommer's IXL, 1st quality, Cork Lined....dis 50 %
J. Sommer's Diamond Lock....dis 40 %
J. Sommer's Perfection, Fla. Red Cedar....dis 50 %
J. Sommer's Goodenough Cedar....dis 60 %
Self-Measuring, Enterprise...₩ doz $36.00—dis 20&10 %
Self-Measuring, Lane's....₩ doz $36.00—dis 25&10 %
Self-Measuring, Victor....₩ doz $36.00—dis 25&10 %

Felloe Plates....₩ lb 6 @ 6¼¢

Fifth Wheels.—Derby and Cincinnati....dis 45&5 %

Files.

Domestic—
Nicholson Files, Rasps, &c....dis 60&5 @ 60&10 %
Nicholson (X. F.) Files....dis 25 %
Nicholson's Royal Files (Seconds)....dis 75 (extra prices on certain sizes.)
Other makers, best brands....dis 60&5 @ 60&10&5 %
Fair brands....dis 60&10&10 @ 70 %
Second quality....dis 70&5 @ 75 %
Heller's Horse Rasps....dis 50&7½ @ 50&10 %
McCaffrey's Horse Rasps....dis 60&10 %

Imported—
J. & Riley Carr....List, April 1, 1883, dis 15 %
J. & Riley Carr Horse Rasps....dis 10 %
Moss & Gamble....List April 1, 1883, dis 15 %
Butcher....Butcher's list, dis 20 %
Stubs....Stubs list, dis 25 @ 30 %
Turton's....Turton's list dis. 20 @ 25 %
Beaver Horse Rasps....American list d 60 %

Flu ing Machines.

Knox, 4½-inch Rolls....$3.25 each
Knox, 6-inch Rolls....$3.60 each } dis 35 %
Eagle 3½-inch Roll....$2.15, dis 35 %
Eagle, 5½-inch Roll....2.85, dis 35 %
Crown, 4½ in., $3.50; 6-in, $4.00; 8-in., $6.50 each, dis 35 %
Crown Jewel....6-in., $3.50 each, dis 35 %
American, 5-in., $3; 6-in., $3.40; 7-in., $4.50 each, dis 35 %
Domestic Fluter....$1.50 each, net
Geneva Hand Fluter, White Metal...₩ doz $12, dis 25 %
Crown Hand Fluter, Nos. 1, $16; 2, $12.50; 3, $10. dis 30 %
Shepard Hand Fluter, No. 85....₩ doz $15.30, dis 40 %
Shepard Hand Fluter, No. 110....₩ doz $11, dis 40 %
Shepard Hand Fluter, No. 95....₩ doz $8, dis 40 %
Clark's Hand Fluter....₩ doz $15.00, dis 35 %
Combined Fluter and Sad Iron....₩ doz $15.00, dis 30 %
Buffalo....₩ doz $10.00 dis 10 %

Fluting Scissors....dis 45 %

Fodder Squeezers.

Blair's....₩ doz $2.60
Blair's, "Climax"....₩ doz $1.25

Forks.—Hay, Manure, &c.. Asso. list....dis 65&5 %

Hay, Manure, &c., Phila. list....dis 60 @ 60&5 %
Plated, see Spoons.

Freezers, Ice Cream.

Buffalo Champion....dis 60&10&5 %
Shepard's Lightning....dis 65 %
White Mountain....dis 60 %

Fruit and Jelly Presses.

Enterprise Mfg. Co....dis 20&10 @ 30 %
Henis....₩ doz $4.50
P. D. & Co....₩ doz $4.50
Shepard's Queen City....dis 40 %

Fry Pans.

High List....dis 75&5 @ 75&10 %

No.	0	2	3	4	6	7	8
₩ doz	$3.75	4.70	5.30	5.95	6.55	7.50	8.75	10.00	11.25

Low List....dis 65&10 %

No	0	1	2	3	4	5	6	7	8
₩ doz	3.00	3.75	4.25	4.75	5.25	6 00	7.00	8.00	9.00

Fuse....₩ 1000 ft.

Common Hemp Fuse, for dry ground....$2.70
Common Cotton Fuse, for dry ground....2.85
Single Taped Fuse, for wet ground....4.75
Double Taped Fuse, for very wet ground....6.00
Triple Taped Fuse, for very wet ground....7.25
Small Gutta Percha Fuse, for water....7.50
Large Gutta Percha Fuse, for water....12.00

Gauges.

Marking Mortise, &c....dis 60&10 %
Starrett's Surface, Center and Scratch....dis 25&10 %
Wire, low list....dis 10&10 ¢
Wire, Wheeler, Madden & Co....dis 10 %
Wire, Morse's....dis 50 @ 50&5 %
Wire, Brown & Sharpe's....dis 10 @ 20 %

Gimlets.—Nail and Spike....dis 50&10&5 %

"Eureka" Gimlets....dis 40&10 %
"Diamond" Gimlets....₩ gross $5.00
Double Cut, Shepardson's....dis 45 @ 45&5 %
Double Cut, Ives'....dis 60 @ 60&5 %
Double Cut, Douglass'....dis 40&10 %
"Bee"....₩ gross $12, dis 25 @ 25&5 %

Glue.—Le Page's Liquid....dis 25 @ 25&5 %

Upton's Liquid....dis 35 %
Le Page Co.'s Nameless Glue....dis 25 @ 25&5 %

Glue Pots.

Tinned and Enameled....dis 40&5 @ 40&10%
Family, Howe's "Eureka"....dis 40 %
Family, L. F. & C.'s "Handy"....dis 50 %

Grindstones.

Small, at factory....₩ ton $7.50 @ 9.0

Grindstone Fixtures.

Sargent's Patent....dis 70&10 %
Reading Hardware Co....dis 30&10 %

Hack Saws.—See Saws.

Halters.—Covert's, Rope, ¼-in. Jute....dis 50&2 %

Covert's, Rope, ¼-in., Hemp....dis 40&2 %
Covert's Adj. Rope Halters....dis 40&2 %
Covert's Hemp Horse and Cattle Tie....dis 50&2 %
Covert's Jute Horse and Cattle Ties....dis 60&10&2 %

Hammers.

Handled Hammers.
Maydole's....List Dec. 1, 1885, dis 25 @ 25&1 0%
Buffalo Hammer Co....List Jan. 15, '87
Humason & Beckley....Dis. 50 @ 50&
Atha Tool Co....10 %
Fayette R. Plumb....dis 40&10 @ 50
C. Hammond & Son....dis 40&10@50
Verree....dis 5 %
Magnetic Tack, Nos. 1, 2, 3, $1.25, 1.50 & 1.75....dis 30&10 %
Nelson Tool Works....dis 40&10 %
Warner & Nobles....dis 20 @ 25 %
Peck, Stow & Wilcox....dis 40 %
Sargent's....dis 33⅓&10 %

Heavy Hammers and Sledges—
8 lb and under....₩ lb 40¢
3 to 5 lb....₩ lb 36¢ } dis 70 & 10 @ 75 %
Over 5 lb....₩ lb 30¢
Wilkinson's Smiths'....10½¢ @ 11¢ ₩ lb

Hand Cuffs and Leg Irons.

Providence Tool Co., Hand Cuffs, $15.00 ₩ doz....dis 10%
Providence Tool Co. Leg Irons, $25.00 ₩ doz....dis 10 %
Tower's....dis 25 %
Daley's Improved Hand Cuffs: 2 Hands, Polished, ₩ doz, $48; Nickeled, $57; 3 Hands, Polished, ₩ doz, $72; Nickeled, $84....dis 25 %

Handles.

Iron, Wrought or Cast.—
Door or Thumb.

Nos.	0	1	2	3	4
Per doz.	$0.90	1.00	1.18	1.35	1.50

....dis 60&10&10
Roggin's Latches....₩ doz. 30¢ @ 3
Bronze Iron Drop Latches....₩ doz. 70¢ net
Jap'd Store Door Handles—Nuts, $1.62; Plate, $1.10; no Plate, $0.88....net
Barn Door....₩ doz. $1.40, dis 10&10 %
Chest and Lifting....dis 70 %

Handles, Wood—
Saw and Plane....dis 40&10 @ 40&10&5 %
Hammer Hatchet Axe, Sledge, &c....dis 40 %
rad Awl....₩ gross $2.00

Hickory Firmer Chisel, assorted....₱ gross 4.50
Hickory Firmer Chisel, large....₱ gross 5.00
Apple Firmer Chisel, assorted....₱ gross 5.00 } dis 40 @ 40&10 %
Apple Firmer Chisel, large....₱ gross 6.00 }
Socket Firmer Chisel, assorted....₱ gross 3.00 } dis 40 @ 40&10 %
Socket Framing Chisel, assorted....₱ gross 5.00 }
J. B. Smith Co.'s Pat. File....dis 50 %
File, assorted....₱ gross 2.75 } dis 40 @
Auger, assorted....₱ gross 5.00 } 40&10 %
Auger, large....₱ gross 7.00 }
Patent Auger, Ives'....dis 30&10 %
Patent Auger, Douglass'....₱ set $1.25 net
Patent Auger, Swan's....₱ set $1.00 net
Hoe, Rake, Shovel, &c....dis 50&10 %

Cross Cut Saw Handles—
Atkins' No. 1 Loop, ₱ pair, 30¢ No. 3, 22¢; No. 2 and No. 4 Reversible, 22¢.
Boynton's Loop Saw Handles....50¢, dis 60 %
Champion....15¢

Hangers.
Barn Door, old patterns....dis 60&10&10 @ 70 %
Barn Door, New England....dis 60&10&10 @ 70 %
Samson Steel Anti-Friction....dis 55 %
Orleans Steel....dis 55 %
Hamilton Wrought Wood Track....dis 55 %
U. S. Wood Track....dis 60 %
Champion....dis 60&10 %
Rider and Wooster, Medina Mfg. Co.'s list....dis 7
Climax Anti-Friction....dis
Climax Steel Anti-Friction....dis 50 %
Zenith for Wood Track....dis 55 %
Reed's Steel Arm....dis 50 %
Challenge, Barn Door....dis 50 %
Sterling Improved (Anti-Friction)....dis 55&10 %
Victor, No. 1, $15; No. 2, $16.50; No. 3, $18....dis 50&10 %
Cherltree....dis 50&10 %
Kidder's....dis 50&10 @ 60 %
The "Boss"....dis 60 %
Best Anti-Friction....dis 60 %
Duplex (Wood Track)....dis 60 %
Terry's Patent....₱ dos. dr. 4 in. $10; 5 in., $12....dis 50&5 %
Cronk's Patent....No. 4, $12; No. 5, $14.40; No. 6, $18....dis 50&10 %
Wood Track, Iron Clad....₱ ft. 10¢, dis 50&15 @ 60 %
Carrier Steel Anti-Friction....dis50 @ 50&5 %
Architect....₱ set $6.00, dis 20 %
Eclipse....dis 20&10
Feil's....₱ set $4.50, dis 20 %
Richards'....dis30@30&10 %
Lane's Steel Anti-Friction....dis 40&10 %
The Ball Bearing Door Hanger....dis 20&10 @ 25&10 %
Warner's Patent....dis 20@20&10 %
Stearns' Anti-Friction....dis 20 @ 20&10 %
Stearns' Challenge....dis 25&10 @ 25&10&10 %
Faultless....dis 40 @ 40&5 %
American....₱ set $6; dis 20&10 %
Rider & Wooster, No. 1, 62½¢; No. 2, 75¢....dis 40 %
Paragon, Nos. 1, 2 and 3....dis 40&10 %
Paragon, Nos. 5, 5½, 7 and 8....dis 20&10 %
Crescent....dis 60@60&10 %
Nickel, Cast Iron....dis 50 %
Nickel, Malleable Iron and Steel....dis 40 %
Scranton Anti Friction Single Strap....dis 33⅓&5 %
Scranton Anti-Friction Double Strap....dis 40 %
Universal Anti Friction....dis 40 %
Wild West, 4 in. wheel, $15; 5 in. wheel, $21....dis 40 %
Star....dis 4 &10 @ 40&10&5 %
May....dis 50&5 @ 10&10 %

Harness Snaps.—See Snaps.

Hatchets.—List Jan. 1, 1886.

Isaiah Blood....dis 35 @40%
Hunt's Shingling Lath and Claw....dis 40&5 %
Hunt's Broad....dis 40 %
Buffalo Hammer Co....dis 40&10@50 %
Hurd's....dis 40&10 @ 50 %
Fayette R. Plumb....d's 40&10 @ 50 %
Wm. Mann, Jr., & Co....dis 50 @ 50&5%
Underhill Edge Tool Co....dis 40&5 @ 40&10 %
Underhill's Haines and Bright goods....dis 33⅓&5 %
C. Hammond & Son....dis 40&10 @ 50 %
Simmons....dis 40&10 @ 50 %
Peck's....dis 40&10 @ 40&10&5 %
Kelly's....dis 50&50&5 %
Sargent & Co....d's 50 %
Ten Eyck Edge Tool Co....dis 40&10@40&10&5 %
Collins, following list....dis 10 %

Shingling, Nos.	1	2	3	₱ doz $5.50 $6.00 $6.50
Claw, Nos.	1	2	3	₱ doz 6.00 6.50 7.00
Lathing Nos.	1	2	3	₱ doz 5.50 6.00 6.50

Hay Knives.
Lightning....Mfrs. price ₱ doz $18, d's 25 % Jobber's Extras
Electric....₱ doz $17 } dis 30 @
Gem....₱ doz $18 } 30&5%
Wadsworth's....dis 40&7½ @ 40&10 %
Carter's Needle....₱ doz $11.50 @ $12.00
Heath's....₱ doz $13.50 @ $14.00

Hinges.
Wrought Iron Hinges—
Strap and T....dis 70&10 &5 @ 70&10&10 %
Screw Hook and Strap. 6 to 12 in. ₱ ℔.... 3½¢; 14 to 20 in., ₱ ℔.... 3¼¢; 22 to 36 in., ₱ ℔.... 2¾¢
Heavy Welded Hook 6 to 12 in., ₱ ℔.... 3½¢; 14 to 20 in., ₱ ℔.... 3¼¢; 22 to 36 in., ₱ ℔.... 2¾¢
Screw Hook and Eye. ⅜ in.₱ dos $1.50 } dis ½ in.₱ dos $2.45 } 10% ⅝ in.₱ dos $3.80 }
Rolled Blind Hinges, Nos 32 and 34....dis 50&10
Rolled Blind Hinges, Nos. 232 and 234....dis 55&10 %
Rolled Plate....dis 70&10 %
Rolled Raised....dis 70&10
Plate Hinges 8, 10 & 12 in., ₱ ℔....5
"Providence" over 12 in., ₱ ℔....4¢

Spring Hinges—
Geer's Spring and Blank Butts....dis 40 %
Union Spring Hinge Co.'s list, March, 1886....dis 20 %
Acme and U. S....dis 30 %
Empire and Crown....dis 20 %
Hero and Monarch....dis 50 %
American, Gem, and Star, Japanned....dis 20 %
American, Gem, and Star, Bronzed....net
Oxford, Bronze and Brass....net
Barker's Double Acting....dis 20&10 %
Union Mfg. Co....dis 25 %
Bommer's....dis 30 %
Buckman's....dis 15@20 %
Chicago....dis 30 %

Gate Hinges—
Western....₱ dos $4.40, dis 55 %
N. E....₱ dos $7.00, dis 55 %
N. E. Reversible....₱ dos $5.20, dis 55&10 %
Clark's, Nos. 1 2 3....dis 60&10&5 %
N. Y. State....₱ dos $5.00, dis 55&10 %
Automatic....₱ dos $12.50, dis 50 %
Common Sense....₱ dos pair $4.50, dis 50 %
Seymour's....dis 45&10 %
Shepard's....dis 60&10&5 %
Reed's Latch and Hinges....₱ dos sets $12, dis 50 %

Blind Hinges—
Parker....dis 75&2 %
Palmer....dis 50&5&10 %
Seymour....dis 70&2 %
Nicholson....dis 45&10 %
Huffer....dis 50 %
Clark's, Nos. 1, 3, 5, 40 and 50....dis 75&10&5&80 %
Clark's Mortise Gravity....dis 50 %
Sargent's, Nos. 1, 3, 5, 11, 13....dis 75&10@75&10&5 %
Sargent's, No. 12....dis 75&10&10 %
Reading's Gravity....dis 75&10 @ 75&10&5 %
Shepard's Noiseless Niagara, Buffalo, Champion, Steamboat, Clark's Old Pattern and Clark's Tip Pattern....dis 75&10&5 %
Shepard's O. S., Lull & Porter....dis 75&10 %
Shepard's Acme, Lull & Porter....dis 75&5 %
Shepard's Queen City Reversible....dis 75 %
Clark's Lull & Porter, Nos. 0, 1, 1½, 2, 2½, 3....dis 75&10&2½ %
North's Automatic Blind Fixtures, No. 2, for Wood, $10.50; No. 3, for Brick, $13.50....dis 25&2 %

Hoes.
Handled—
Garden, Mortar, &c....dis 65&5 %
Planter's, Cotton, &c....dis 65&5 %
Warren Hoe....dis 60 %
Magic....₱ doz $4.75

Eye—
D. & H. Scovill....dis 20
Lane's Crescent Scovil Pattern....dis 45 %
Lane's Crescent Planters Pattern....dis 45 & 5 %
Lane's Razor Blade, Scovil Pattern....dis 30 %
Maynard, S. & O. Pat....dis 45&5 %
Randusky Tool Co., " "....dis 60 %
Hubbard & Co., " "....dis 60 %
Base " "....dis 60 %
Grub....dis 60 @ 60&10 %

Hog Rings and Ringers.
Hill's Improved Ringers....₱ doz. $4.50
Hill's Old Style Ringers....₱ doz. $3.00
Hill's Tongs....₱ doz, $4.50
Hill's Rings....₱ doz boxes, $2.25 @ 2.40
Perfect Rings....₱ doz boxes $1.75 @ 2.00
Perfect Ringers....₱ doz. $2.50
Blair's Hog Ringers....₱ doz, $2.6(@ $2.65
Blair's Hog Rings....₱ doz 95¢ @ $1.00
Champion Ringers....₱ doz $2.00
Champion Rings, Double....₱ doz, $2.25
Brown's Ringers....₱ doz, $2.00
Brown's Rings....₱ doz, $1.25 @ 1.30

Hoisting Apparatus.
"Moore's" Hand Hoist, with Lock Brake....dis 70 %
"Moore's" Differential Pulley Block....dis 40 %

Holders, File and Tool.
Rails Pat....₱ doz $4; dis 25 %
Nicholson File Holders....dis 20 %

Hollow-Ware.
Iron—
Stove Hollow-Ware, Ground....dis 60&10@60&10&5 %
Stove Hollow-Ware, Unground....dis 70 @ 70&5 %
Enameled and Tinned Hollow-Ware—
Kettles....dis 70 @ 70&5 %
Oval Boilers, Saucepans & Glue Pots....dis 40&5 @ 40&10 %
Gray Enameled Ware....dis 50&10 @ 50&10&5 %
Agate and Granite Ware....dis 25 %
Rustless Hollow-Ware....dis 50 @ 50&5 %
Galvanized Tea-Kettles—

Inch	6	7	8	9
Each	55¢	60¢	65¢	75¢

Silver Plated—4 mo. or 5 % cash in 30 days.
Reed & Barton....dis 40&5 %
Meriden Brittania Co....dis 40&5 %
Simpson, Hall, Miller & Co....dis 40&5 %
Rogers & Brother....dis 40&5 %
Hartford Silver Plate Co....dis 40&5&5 %
William Rogers Mfg. Co....dis 40&5&5 %

Hooks.
Cast Iron—
Bird Cage, Sargent's list....dis 60&10&10%
Bird Cage, Reading....dis 60&10&10 %
Clothes Line, Sargent's list....dis 60&10&10 %
Clothes Line, Reading list, dis 60&10 @ 60&10&10 %
Ceiling, Sargent's list....dis55&10&10 %
Harness, Reading list....dis 55&10 @ 55&10&10 %
Coat and Hat, Sargent's list....dis 55&10 @ 60&10 %
Coat and Hat, Reading....dis 50&10 @ 50&10&10 %

Wrought Iron—
Cotton....₱ doz $1.2(
Cotton Pat. (N. Y. Mallet & Handle W'ks)....dis 30 %
Tassel and Picture (T. & S. Mfg. Co.)....dis 50 %
Wrought Staples, Hooks, &c....See Wrought Goods
Bench Hooks....See Bench Stops

Wire—
Wire Coat and Hat, Gem, list April, 1886....dis 45 %
Wire Coat and Hat Miles', list April, 1886....dis 45 %
Indestructible Coat and Hat....dis. 45 %
Wire Coat and Hat, Standard....dis. 45 %
Belt....dis 75&10 @ 80 %
Grass....₱ doz $2.0(
Bush....dis 55 @ 60 %
Whiffletree—Patent....dis 55 %
Hooks and Eyes—Malleable Iron....dis 70 @ 70&10 %
Hooks and Eyes—Brass....dis 60&10&10 %
Fish Hooks, American....dis 50 %

Horse Nails.

	No. 6	7	8	9	10	
Ausable	28¢	26¢	25¢	24¢	23¢	dis 25&10@25&10&10 %
Clinton, Fin.	24¢	22¢	21¢	20¢	19¢	dis 40&10 @ 50 %
Essex	28¢	26¢	25¢	24¢	23¢	dis25&10@25&10&10
Lyra	25¢	23¢	22¢	21¢	20¢	dis 40&10&10@50 %
Snowden	25¢	23¢	22¢	21¢	20¢	dis 40&10&5@10 %
Putnam	24¢	22¢	21¢	20¢	19¢	dis 5d 10&2½&2½ %
Vulcan	23¢	21¢	20¢	19¢	18¢	dis 12½&5
Northwest'n	25¢	23¢	22¢	21¢	20¢	dis 10&10&5&5 %
Globe	23¢	21¢	20¢	19¢	18¢	dis 12½&5&5 %
A. C.	25¢	23¢	22¢	21¢	20¢	dis 25&10 @ 33⅓&5 %
C. B.-K.	25¢	23¢	22¢	21¢	20¢	dis 25&10 @ 33⅓&5 %
Champlain	28¢	26¢	25¢	24¢	23¢	dis25&10&10 %
New Haven	28¢	26¢	25¢	24¢	23¢	dis25&10@25&10&10 %
Saranac	23¢	21¢	20¢	19¢	18¢	dis 30&10 %
Champion	25¢	23¢	22¢	21¢	20¢	dis 10&10&10 %
Capewell	28¢	26¢	25¢	24¢	23¢	dis 35&5 @ 35&10 %
Star	23¢	21¢	20¢	19¢	18¢	dis 10&10@10&17½ %
Anchor	23¢	21¢	20¢	19¢	18¢	dis 35 %
Western	23¢	21¢	20¢	19¢	18¢	dis 40&10 %
Empire Bronzed						14 per lb.

Horse Shoes.—See Shoes, Horse.

Hose, Rubber, competition.. 75&10 @ 75&10&5 %
Standard....dis 70@7 &10 %
Extra....dis 60 @ 60&10 %
N. Y. R. & P. Co., Para....dis 30&10 %
N. Y. R. & P. Co., Extra....dis 50 %
N. Y. R. & P. Co., Dundee....dis 60&10&5 %

Hurders.
Blair's Adjustable....₱ gross $8.00
Blair's Adjustable Clipper....₱ gross 7.00

Jack Screws.—See Screws.

Kettles.

	Spun.	Stamped
Brass, 7 to 17 in., ₱ ℔....	24¢	21 ¢
Brass larger than 17 inches, ₱ ℔..	26¢	23½¢

Enameled and Tea Kettles....See *Hollow Ware*

Keys.
Lock Asso'n list Dec. 30, 1886....dis 50&10 @ 60&5 %
Eagle, Cabinet, Trunk and Padlock....dis 33⅓&2 %
Hotchkiss' Brass Blanks....dis 40 %
Hotchkiss' Copper and Tinned....dis 40 %
Hotchkiss' Padlock and Cabinet....dis 35 %
Ratchet Bed Keys....₱ doz $4.00, dis 15 %

Knife Sharpeners.
Parkin's Applewood Handles....₱ doz $6.00, dis 40 %
Parkin's Rosewood or Cocobolo....₱ dos $9.00, dis 40 %

Knives.
Wilson's Butcher Knives....dis 20 @ 25 %
Ames' Butcher Knives....dis 25 %
Nichols' Butcher Knives....dis 40&10
Ames' Shoe Knives....dis 20@25 %
Ames' Bread Knives....₱ dos $1.50, dis 15 @ 20 %
Moran's Shoe and Bread Knives....dis 20 %
Hay and Straw....See Hay Knives
Table and Pocket....See Cutlery

Knobs.
Door Mineral....65@68¢
Door Por. Jap'd....75@78¢
Door Por. Por. Nickel....$2.00 @ 2.25
Door Por. Plated, Nickel....$2.00 @ 2.25
Drawer, Porcelain....dis 55&10&10@6..&10&10 %
Hemacite Door Knobs, new list....dis 40&10@50 %
Yale & Towne Wood Knobs, list Dec., 1885....d's 40 %
Furniture Plain....75¢ gross inch, dis 10 %
Furniture, Wood Screws....dis 25&10 %
Base, Rubber Tip....dis 70&10&5 %
Picture, Judd's....dis 60&10&10 @ 70 %
Picture, Sargent's....dis 70&10 %
Picture, Hemacite....dis35&5 %
Shutter, Porcelain....dis 65&10 %
Carriage, Japanned....₱ gross 80¢, dis 60&10 %

Ladies.
Melting, Sargent's....dis 55&10 %
Melting, Reading....dis 35&10%
Melting, Monroe's Patent....₱ doz. $4.00, dis 40%
Melting, P. S. & W....dis 35&10 @ 40%
Melting, Warner's....dis 30%

Lawn Mowers.
Standard List....dis 50&10 %
Enterprise....dis 60&10 %

Lanterns.
Tubular, Plain, with Guards....₱ doz $4.00 @ $4.25
Tubular, Lift Wire, with Guards....₱ doz $4.50 @ $4.75
Tubular, Square Plain, with Guards, ₱ doz $4.00 @ $4.25
Tubular, Sq. Lift Wire, with Guards, ₱ doz $4.25 @ $4.50
Without Guards, 25¢ ₱ dozen less.
Police, Small, $6.00; Med. $7.25; Large, $9.75, dis 20@25¢

Lemon Squeezers.
Porcelain Lined, No. 1....₱ doz. $6.00, dis 25&30 %
Wood, No. 2....₱ doz. $3.00, dis 35 %
Wood, Common....₱ doz $1.70 @ 1.75
Dunlap's Improved....₱ doz. $3.75, dis 20 @
Sammis'....No. 1, $5; 2, $9; 12, $18 ₱ doz., dis 25&10 @
Jennings' "Star"....₱ doz $2.50
The "Boss"....₱ doz $2.50
Dean's....Nos. 1, ₱ doz $6.50; 2, $8.35; 3, $1.90
Little Giant....dis 50 @ 50&5 %
King....dis 40&5 %

Lines.
Cotton and Linen Fish, Draper's....dis 50 %
Draper's Chalk....dis 60 %
Draper's Mason's Linen, 84 ft., No. 1, $1.25; No. 2, $1.75; No. 3, $2.25; No. 4, $2.75; No. 5, $3.25....dis 25 %
Cotton Chalk....dis 55 %
Samson, Cotton, No. 4, ₱; No. 4½, $2.50....dis 10 %
Silver Lake, Braided, Nos. 0, $6.00 No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ₱ gross....dis 25 %
Masons' Linen, No. 3½, $1.50; No. 4, $2; No. 4½, $2.50
Masons' Colored Cotton....dis 45
Wire Clothes, No. 18, $3.60; No 19, $3.00; No. 20, $2.50.
Ventilator Cord, Samson Braided, White or Drab Cotton....$7.50 ₱ doz. dis 30%

Locks, Padlocks, Cabinet Locks, &c.
Door Locks, Latches, &c.—
List, Dec. 30, '86, chgd Feb. 2, '87....dis 50&10 @ 60&5 %
Mallory, Wheeler Co., list, July, 1888....dis 50&10@60 %
Sargent & Co.' list Aug 1, 1888....dis 55&2&10@60&10 %
Reading Hardware Co. (list Feb. 2, '88)....dis 55@6&10 %
Livingston & Co....dis 70 %
Note.—Lower net prices often made.
Perkins' Burglar Proof....dis 60&25 %
Plate....dis 33⅓&2 %
F. Many's "Extension Cylinder"....$10.50 ₱ doz
Barnes Mfg. Co....dis 40 %
Yale Corrugated Key....dis 33⅓ %
Dietz Flat Key....dis 30 %
L. & C. Round Key Latches....dis 30&10 %
L. & C. Flat Key Latches....dis 33⅓&10 %
Romer's Night Latches....dis 15 %
Yale new list....dis 33⅓ %
"Shepardson" or "U. S."....dis 35 %
"Felter" or "American"....dis 40&10 %
Seed's N. Y. Hasp Lock....dis 25 %

Cabinet—
Eagle, Gaylord Parker and Corbin, } List March, '84, revised Jan. 1, '85. dis 33⅓&2 %
Deitz, Nos. 36 to 39....dis 40 %
Deitz, Nos. 51 to 63....dis 40 &10 %
Dietz, Nos. 86 to 96....dis 30 %
Stoddard Lock Co....dis 30 @ 33⅓ %
"Champion" Night Latches....dis 40 %
Barnes Mfg. Co....dis 40 %
Eagle and Corbin Trunk....dis 25&2½
Champion" Cabinet and Combination....dis 33⅓ %
Yale....dis 33⅓ %
Romer's....dis 25 %

Padlocks—
List, Dec. 23, 84....dis 75 @ 75&10 %
Yale Lock Mfg. Co.'s....dis 25&5 %
Eagle....dis 25&2½ %
Eureka, Eagle Lock Co....dis 40&2 %
Romer's, Nos. 0 to 91....dis 30 %
Romer's Scandinavian, &c, Nos. 100 to 606....dis 15 %
A. E. Dietz....dis 40 %
"Champion" Padlocks....dis 40 %
Hotchkiss....dis 30 %
"Star"....dis 45 %
"Horse Shoe," ₱ doz., $9....dis 40 %
Barnes Mfg. Co....dis 40 %
Nock's....dis 30 %
Brown's Patent....dis 25 %
Scandinavian....dis 90 @ 90&10 %
Praim's Pat. Scandinavian new list (low)....dis 60 %

Lumber Tools.
Ring Peavies, "Blue Line" Finish....₱ doz $20.00
Ring Peaves, Common Finish....₱ doz $18.00
Steel Socket Peavies....₱ doz $21.00
Mall. Iron Socket Peavies....₱ doz $19.00
Cant Hooks, "Blue Line" Finish....₱ doz $16.00
Cant Hooks, Common Finish....₱ doz $14.00
Cant Hooks, Mall. Socket Clasp, "Blue Line" Finish....₱ doz $16.00
Cant Hooks, Mall. Socket Clasp Common Finish....₱ doz $14.50
Cant Hooks, Clip Clasp, "Blue Line" Fin. ₱ doz $14.00
Cant Hooks, Clip Clasp, Common Finish..₱ doz $12.00
Hand Spikes....₱ doz 6 ft., $15.00; 8 ft., $20
Pike Poles, Pike & Hook, 12 ft. 14 ft. 16 ft. 18 ft. 20 ft. ₱ doz....$11.50 12.50 14.50 17.50 21.50
Pike Poles, Pike only, ₱ doz....10.00 11.00 13.00 16.00 20.00
Pike Poles, not Ironed, ₱ doz....6.00 7.00 9.00 12.00 16.0
Setting Poles, ₱ doz....14.00 15.00 17.00
Swamp Hooks....₱ doz $18.00

Lustre.
Four-ounce Bottles....₱ doz $1.75 ₱ gro. $17. 0(

Mallets.
Hickory....dis 20&10@20&10&10 %
Pignumvitas....dis 20&10@20&10&10 %
B. & L. Block Co, Hickory and L. V....dis 30 @ 30&10 %

Match Safes.
Dangerfield's Self Igniting....₱ doz $1.50

Matlocks.—Regular list....dis 60&10 @ 60&10&5 %

Meat Cutters

Dixon's—Nos.	1	2	3	4	
₱ doz	$14.00	17.00	19.00	30.00	—dis 40&5 %
Woodruff's Nos.		100	150		
			₱ doz. $15.00	18.00	—dis 50&5 %
Champion Nos.		200	300	400	
	₱ doz.	$22.00	27.00	40.00	—dis 50&5 %
Hales' Pattern Nos.	11	12	13		
	₱ dos...	$27.00	33.00	45.00	} dis 70 @ 70&5 %

American....d's

Nos.	1	2	3	4B		
Each	$5.00	7.00	10.00	25.00	50.00	60.00

Enterprise....dis 3 %

Nos.	10	12	22	33	42
Each	$3.	2.50	4.00	6 00	14.00

Pennsylvania.....dis 40&10%
Nos. 1 2 3 00
₩ doz. $24.00 28.00 36.00 28.00
Miles' Challenge..Nos. 1 2
₩ doz. $22.00 30.00 40.00—dis 45@45&10 %
Home No. 1.....$26 ₩ doz, dis 55&10 %
Draw Cut...Nos. 5 6 7 8
Each....$50.00 75.00 80.00 225.00—dis 20 @ 25 %
Beef Shavers (Enterprise Mfg. Co.)...dis 20&10 @ 30 %
Chadborn's Smoked Beef Cutter.....₩ doz, $66.00

Mincing Knives.

Am. (2d quality), ₩ gro, 1 blade, $7; 2 blades, $12; 3 blades, $18.....net
Lothrop's.....dis 20&10 %
Smith's, ₩ doz, Single, $2.00; Double, $3....dis 40@45 %
Knapp & Cowles.....dis 50&10@60 %
Buffalo Adjustable.....₩ doz $3.00, dis 25 %

Molasses Gates.—Stebbins' Pat..dis 70@10 & 7½ %
Stebbins' Genuine.....dis 60&10&10 %
Stebbins' Tinned Ends.....dis 40&10 %
Chase's Hard Metal.....dis 50&10 %
Bush's.....dis 20 %
Lincoln's Pattern.....dis 70 @ 70&10 %
Weed's.....dis 20&10 %

Sass Nos.. 1 2 3 4
$7.00 8.00 9.00 10.00. ₩ doz. dis 60&10&10 %

Money Drawers.—₩ doz., $18 @ $20.

Muzzles.—Safety, ₩ doz. $3.....dis 25 %

Nails.—See Trade Report
Wire Nails & Brads, list July 14, 87...dis 70&10 %
Wire Nails, Standard Penny.....₩ keg, $2 60 @ $2.70

Nail Puller.—Curtiss Hammer...₩ doz $9.00 net
Giant, No. 1.....₩ doz $90.00, dis10 %
Pelican.....₩ doz $9.00, dis 25 %
Boss.....₩ doz $30, dis 30 %

Nail Sets.—Square.....₩ gro., $4.00 @ $4.25
Round.....₩ gro., $3.25
Cannon's Diamond Point.....₩ gro. $12 dis 20 %

Nut Crackers.
Table (Humason & Beckley Mfg. Co.).....dis 40 %
Blake's Pattern.....₩ doz $2.00, dis 10 %
Turner & Seymour Mfg. Co.....dis 50 %

Nuts.
Nuts, all kinds, 5½¢ off list Jan. 1, 1888.
In lots less than 100 ℔, ₩ ℔, add ¼¢, 1 ℔ boxes add 1¢ to list.

Oakum.
Government.....₩ ℔ 8¢
U. S. Navy.....₩ ℔ 7¢
Navy.....₩ ℔ 6¢ @ 6¼¢

Oilers.—Zinc and Tin.....dis 65 & 65&10 %
Brass and Copper.....dis 50&10@50&10&5 %

Malleable Hammers' Improved, No 1, $3.60; No. 2, $4.00; No. 3, $4.40 ₩ doz.....dis 10 @ 10&10 %
Malleable, Hammers, Old Pattern, same list....dis 40 %
Prior's Patent or "Paragon" Zinc.....dis 60&10&10 %
Prior's Patent or "Paragon" Brass.....dis 50 %
Olmstead's Tin and Zinc.....dis 60 %
Olmstead's Brass and Copper.....dis 50 %
Broughton's Zinc.....dis 60 %
Broughton's Brass.....dis 50 %

Packing, Steam.

Rubber—
Standard.....dis 60&10 @ 60&10&10 %
Extra.....dis 50&10 @ 60 %
N. Y. B. & P.Co., Standard.....dis 50&10&5 %
N. Y. B. & P. Co., Empire.....dis 70 %
N. Y. B. & P. Co., Salamander.....₩ ℔ 65¢, dis 30 %
Jenkins' Standard.....₩ ℔ 80¢, dis 35 %

Miscellaneous—
American Packing.....10¢ @ 11¢ ₩ ℔
Russia Packing.....14¢ ₩ ℔
Italian Packing.....13 @ 14¢ ₩ ℔
Cotton Packing.....15 @ 17¢ ₩ ℔
Jute.....7 @ 8¢ ₩ ℔

Padlocks.—See Locks.

Palls.

Galvanized Iron—

Quarts	10	12	14
Hill's Light Weight, ₩ doz	$2.75	3.00	3.25
Hill's Heavy Weight, ₩ doz	3.00	3.25	3.75
Whiting's	2.75	3.00	3.25
Sidney Shepard & Co	2.80	....	3 40
Iron Clad	2.75	3.00	3.25
Fire Buckets	2.75	3.25	3.50

Buckets, see Well Buckets

Indurated Fibre Ware—
Star Pails, 12 qt.....₩ doz $4 50
Fire Stable and Milk, 14 qt.....₩ doz $5.50

Pencils. Faber's Carpenters'.....high list, dis 50 %
Faber's Round Gilt.....₩ gro $5.25 net
Dixon's Lead.....₩ gro $4.50 net
Dixon's Lumber.....₩ gro $6.75 net
Dixon's Carpenters'.....dis 40&10 %

Picks.
Railroad, 5 to 6, $12.00; 6 to 7, $13, dis 60&10@60&10&5 %
Adze Eye, 5 to 6, $12.00; 6 to 7, $13, dis 60&10@60&10&5 %

Picture Nails.
Brass Head, Sargent's list.....dis 50&10&10 %
Brass Head, Combination list.....dis 50&10 %
Porcelain Head, Sargent's list.....dis 50&10&10 %
Porcelain Head, Combination list.....dis 40&10 %
Miles' Patent.....dis 40 %

Pinking Irons......₩ doz 65¢ net

Pipe, Wrought Iron.—List March 23, 1887.
1¼ and under, Plain.....dis 52½ %
1¼ and under Galvanized.....dis 45 %
1¼ and over, Plain.....dis 62½ %
1¼ and over, Galvanized.....dis 52½ %
Boiler Tubes, Iron.....dis 60 %

Planes and Plane Irons.

Wood Planes—
Moulding.....dis 5(&5 @ 50&10 %
Bench, First Quality.....dis 50&10 @ 60 %
Bench, Second Quality.....dis 60&10 @ 60&10&5 %
Bailey's (Stanley R. & L. Co.)...dis 30&10 @ 30&10 %

Iron Planes—
Bailey's (Stanley R. & L. Co.)...dis 30&10@30&10&5 %
Miscellaneous Planes (Stanley R. & L. Co.dis 20&10 %
Victor Planes (Stanley R. & L. Co.)...dis 20& 10 %
Steer's Iron Planes.....dis 35 @ 35&5 %
Meriden Mfg. Iron Co.'s.....dis 30&10@30&10&5 %
Davis's Iron Planes.....dis 30&10@30&10&10 %
Birmingham Plane Co.....dis 50@50&5 %
Gage Tool Co.'s Self-Setting.....dis 20 %
Chaplin's Iron Planes.....dis 40 @ 40&5 %
Sargent's.....dis 30&10 @ 30& 0&10 %

Plane Irons—
Plane Irons.....dis 20&10 %
Plane Irons, Butcher's.....$5.00 @ $5.25 to $
Plane Irons, Buck Bros.....dis 30 %
Plane Irons, Auburn Tool Co., "Thistle".....dis 40 %
Plane Irons, Middlesex Mfg. Co., "Baldwin Iron," Single and Cut.....dis 20 @ 25 %
Double.....dis 33⅓ @ 40 %
L. & I. J. White.....dis 25 %

Pliers and Nippers.
Button's Patent.....dis 30&10 @ 40 %
Hall's Pat. Compound Lever Cutting Nippers, No. 2. 5 in., $13.50; No. 4, 7 in., $21.00 ₩ doz dis 20&10@ 33⅓ %
Emmerson & Beckley Mfg. Co.....dis 50@50&5 %
Gas Pliers.....dis 60 %
Gas Pliers, Custer's Nickel Plated.....dis 60&5 %
Eureka Pliers and Nippers.....dis 40 %
Russell's Parallel.....dis 25 %
P. S & W. Cast Steel.....dis 50 %
P. S. & W. Tinners' Cutting Nippers....add 6 % dis 10 %
Carew's Pat. Wire Cutters.....dis 20 %
Morrill's Parallel, per doz., $12.....dis 30&5 %
Cronk's 8 in., $15; 10 in., $21.....dis 10 @ 40&5 %

Plumbs and Levels.
Regular List.....dis 70&10@70&10&10 %
Disston's.....dis 45&10 %
Pocket Levels.....dis 70&10@70&10&10 %
Davis Iron Levels.....dis 30 %
Davis' Inclinometers.....dis 10&10 %

Poppers, Corn.
Round or Square, 1 qt.....₩ gro $12 @ $15
Round or Square, 2 qt.....₩ gro $25 @ $26

Post Hole and Tree Augers and Diggers.
Samson Post Hole Digger.....₩ doz $36.00, dis 25&10 %
Fletcher Post Hole Augers.....₩ doz $36.00, dis 20 %
Eureka Diggers.....₩ doz $16 @ $17
Leed's.....₩ doz $8.00 @ $9.00
Vaughan's Post Hole, Auger, per doz....$13 00 @ $14.00
Kohler's Little Giant.....₩ doz $18.00
Kohler's Hercules.....₩ doz $15.00
Kohler's New Champion.....₩ doz $9.00
Schneidler.....₩ doz $18
Kyan's Post Hole Diggers.....₩ doz $24
Cronk's Post Bars.....doz $60, dis 50&5 @ 50&10 %
Gibb's Post Hole Digger, ₩ doz $30....dis 40 @ 40&10 %

Potato Parers.
White Mountain.....₩ doz $5.00 @ 5.50
Antrim Combination.....₩ doz $8.00
Hoosier.....₩ doz $13.50

Pruning Hooks and Shears.
Disston's Combined Pruning Hook and Saw, ₩ doz $18.00.....dis 20&10 %
Disston's Pruning Hook.....₩ doz $12.00, dis 20&10 %
E. S. Lee & Co.'s Pruning Tools.....dis 40 %
Pruning Shears, Henry's Pat...₩ doz $3.75 @ $4.00 net
Henry's Pruning Shears.....₩ doz $4.25 @ $4.50 net
Wheeler, M. & Co.'s Combination...₩ doz $12, dis 20 %
Dunlap's Saw and Chisel.....₩ doz $8.50, dis 30 %
J. Mallinson & Co.....No. 1, $5.25; No. 2, $7.25

Pulleys.—Hot House, Awning, &c.....dis 60&10 %
Japanned Screw.....dis 60&10 %
Brass Screw.....dis 60&10 %
Japanned Side.....dis 60&10 %
Japanned Clothes Line.....dis 60&10 %
Empire Sash Pulley.....dis 55 @ 60 %
Moore's Sash, Anti Friction.....dis 50 %

Hay Fork, Solid Eye, $4.00; Swivel, $4.50 } dis 50&10 @ 50&10&5 %
Hay Fork, "Anti-Friction," 5 in. Solid, $5.70....dis 50 %
Hay Fork, "F" Common and Pat. Bushed.....dis 20 %
Hay Fork, Tarbox Pat. Iron.....dis 20 %
Hay Fork, Reed's Self-Lubricating.....dis 60 %
Shade Hooks.....dis 45 %
Tackle Blocks.....See Blocks

Pumps.—Cistern, Best Makers.....dis 50 @ 10&60 %
Pitcher Spout, Best Makers...dis 60&10 @ 60&10&10 %
Pitcher Spout, Cheaper Goods..dis 70&5 @ 70&10&5 %

Punches.
Saddlers' or Drive, good quality.....₩ doz 60¢ @ 65¢
Bemis & Call Co.'s Cast Steel Drive.....dis 50&5 %
Bemis & Call Co.'s Springfield Socket.....dis 50&5 %
Spring, good quality.....₩ doz $2.50 @ $2.60
Spring, Leach's Patent.....dis 15 %
Bemis & Call Co.'s Spring and Check.....dis 40 %
Solid Tinners'.....₩ doz $1.44....dis 55 %
Tinners' Hollow Punches.....dis 30&2 %
Rice Hand Punches.....dis 15 %
Avery's Revolving.....dis 30&10 %
Avery's Saw-Set and Punch.....dis 30&5 %

Rail.
Sliding Door, Wrt. Brass ₩ ℔ 35¢.....dis 15 %
Sliding Door, Bronzed Wrt. Iron.....₩ foot 7¢
Sliding Door Iron, Painted...₩ foot 4¢, dis 20&10&5 %
Barn Door, Light....Inch. ¼ ⅝
Per 100 feet.....$2.50 3.00 4.40—dis 10 %
B L for N E. Hangers—

	Small.	Med.	Large
Per 100 feet	$2.15	2.70	3.25 net

Terry's Wrought Iron, ₩ foot.....4½¢ @ 5¢
Victor Track Rail, 7¢ ₩ foot.....dis 50&2 %
Carrick Steel Rail, per foot.....4½¢

Rakes.
Cast Steel, Association goods.....dis 65&5 %
Cast Steel, outside goods.....dis 60&10 @ 70 %
Malleable.....dis 70 @ 70&5 %
Gibbs Lawn Rake.....$12, dis 40 %
Canton Lawn Rake.....$9, dis 40 %
Ft. Madison Prize Bow Brace and Peerless..dis 65&5 %
Fort Madison Steel Tooth Lawn Rake, $6.....dis 25 %

Razors.—J. R. Torrey Razor Co.....dis 20%
Wostenholme and Butcher.....$10 to $, dis 10 %

Razor Strops.
Genuine Emerson.....dis 60 @ 60&5 %
Imitation Emerson.....₩ doz $2.00, dis 20&10&5 %
Torrey's.....dis 20 %
Badger's Bevel Combination.....₩ doz $2
Lamont Combination.....₩ doz $4

Rivets and Burrs.
Copper.....dis 50 @ 50&10 %
Iron, list November 17, 1887.....dis 50 @ 50&7½ %

Rivet Sets......dis 50&2 @ 50&10 %

Rods.—Stair, Brass.....dis 2o&2 %
Stair, Black Walnut.....₩ doz 40¢

Rollers.
Barn Door, Sargent's list.....dis 60&10&10 %
Acme (Anti-Friction).....dis 55 %
Union Barn Door Roller.....dis 70 %

Rope.—Manufacturers' prices for large lots.
Manila.....⅝ inch and larger ₩ ℔ 11¢ net
Manila.....⅝ inch ₩ ℔ 11½¢ net
Manila.....½ and 9-16 inch ₩ ℔ 12½¢ net
Manila Tarred Spun.....₩ ℔ 13½¢ net
Manila, Hay Rope.....₩ ℔ 11½¢ net
Sisal.....⅝ inch and larger ₩ ℔ 9½¢ net
Sisal.....⅝ inch ₩ ℔ 9½¢ net
Sisal.....½ and 9-16 inch ₩ ℔ 10½¢ net
Sisal, Hay Rope.....₩ ℔ 9½¢ net
Sisal, Tarred Rope.....₩ ℔ 8½¢ net
Sisal, Medium Lath Yarn.....₩ ℔ 8½¢ net
Cotton Rope.....₩ ℔ 15 @ 18¢ net
Jute Rope.....₩ ℔ 7¢

Discount 1% for cash in 10 days.

Rules.
Boxwood.....dis 80&10 @ 80&10&10 %
Ivory.....dis 50 @ 50&10 %
Starrett's Rules and Straight Edges, Steel, dis 22&10 %

Sad Irons.
From 4 to 10, at factory.....₩ 100 ℔ $2.40 @ $2.55
Self Heating.....₩ doz, $9.00 net
Self Heating, Tailors'.....₩ doz, $18.00 net
Gleason's Shield and Toilet.....dis 25 %
Mrs. Pott's Irons.....dis 40@40&5 %
Enterprise Star Irons, new list, July 20, 1882....dis 40 %
Combined Fluter and Sad Iron...₩ doz, $15.00, dis 15 %
Fox Reversible, Self Fluter.....₩ doz, $24.00 net
Chinese Laundry (N. E. Butt Co.).....85¢, dis 15 %
New England.....85, dis 15 %
Mahony's Troy Pol. Irons.....dis 25%
Sensible.....dis 20 @ 20&5 %

Sand and Emery Paper and Cloth.
List April 19, 1886.....dis 20@20&5 %
Sibley's Emery and Crocus Cloth.....dis 30 %

Sash Cord.
Common.....₩ ℔, 10¢ @ 11¢
Patent, good quality.....₩ ℔ 18¢ @ 18½¢
White Cotton Braided, fair quality.....₩ ℔ 18¢ @ 2
Common Braid Sash.....₩ ℔ 13½¢
Patent " .....₩ ℔ 16¢
Cable Laid Italian " .....₩ ℔ 22¢ @ 23¢
India Cable Laid " .....₩ ℔ 13¢
Silver Lake, A Quality, White.....50¢, dis 10&10&5 %
Silver Lake, A Quality, Drab.....55¢, dis 10&10&5 %
Silver Lake, B Quality, White.....60¢, dis 20&10&5 %
Silver Lake, B Quality Drab.....60¢, dis 20&10&5 %
Silver Lake, C Quality, White (only).....27¢ @ 28¢
Sylvan Spring, Extra Braided, White.....34¢
Sylvan Spring, Extra Braided, Drab.....30¢
Semper Idem, Braided, White.....30¢
Egyptian, India Hemp, Braided.....25¢
Samson, Braided, White Cotton....60¢ dis 30 @ 30&5 %
Samson, Braided, Drab Cotton.....55¢ dis 30 @ 30&5 %
Samson, Braided Italian Hemp.....55¢ dis 30 @ 30&5 %
Samson Braided Linen.....80¢ dis 30 @ 30&5

Sash Locks.
Clark's No. 1, $10.00; No. 2, $8.00 ₩ gross.....dis 33⅓ %
Ferguson's.....dis 33⅓ %
Morris and Triumph, list Aug. 16, 1886.....dis 60&2 %
Victor.....60&10&2 %
Walker's.....dis 10 %
Attwell Mfg. Co.....dis 25 @ 33⅓ %
Reading.....dis 60⅔&10 @ 66⅔&10&10 %
Hammond's Window Springs.....dis 40 %
Common Sense, Jap d. Cop'd and Br'zed..₩ gross $4.00
Common Sense, Nickel Plated.....₩ gross $10.00
Universal.....dis 30 %
Kempshall's Gravity.....dis 60 %
Kempshall's Model.....dis 60@60&10 %
Corbin's Daisy, list February 15, 1886.....dis 70 %
Payson's Perfect.....dis 60 @ 60&10 %
Huguniu's New and Improved Adjustable Sash Balances, list Jan. 5, 1887.....dis 25&5&2 %
Huguniu's New Sash Locks, list Jan. 5, '87.dis 25&5&2 %
Stoddard "Practical".....dis 10 %
Ives Patent.....dis 60 %
Liesche's Nos. 100 & 110, ₩ gro, $8; 105, $10.dis 20&10 %
Davis, Bronze, Barnes Mfg. Co.....dis 50 %
Champion Safety, List March 1, 1888....dis 55@55&5 %
Security.....dis 70 %

Sash Weights.
Solid Eyes.....₩ ton $22

Sausage Stuffers or Fillers.
Miles' "Challenge".....₩ doz. $20, dis 50@50&5 %
Perry.....₩ doz. No. 1, $15; No. 0, $21, dis 50@50&5 %
Draw Cut No. 4.....each, $30.00, dis 20 %
Enterprise Mfg. Co.....dis 20&10 @ 30 %
Silver's.....dis 40&10 %

Saws.
Disston's Circular....dis 45@45&5 %) Extras some-
Disston's Cross Cuts..dis 45@45&5 %) times given by
Disston's Hand.....dis 25@25&5 %) jobbers.
Atkins' Circular.....dis 50 %
Atkins' Silver Steel Diamond X Cuts.....₩ foot 70¢
Atkins' Special Steel Dexter X Cuts.....₩ foot 50¢
Atkins' Special Steel Diamond X Cuts.....₩ foot 30¢
Atkins' Champion and Electric Tooth X Cuts.....₩ foot 27 @ 28¢
Atkins' Hollow Back X Cuts.....₩ foot 18¢
Atkins' Shingle, Mulay, Drag, &c.....dis 45 %
W. M. & C., Hand.....dis 30&5 @ 30&10 %
W. M. & C. Champion X Cuts. Regular ₩ foot .24¢@26¢
W. M. & C. X Cuts. Thin Back.....₩ foot 27¢ @29¢
Peace Circular and Mill.....dis 25&10 %
Peace Hand Panel and Rip...dis 20&10 @ 20&10&10 %
Peace Cross Cuts, Standard.....₩ foot 25¢
Peace Cross Cuts, Thin Back.....₩ foot 27¢@28¢
Richardson's Circular and Mill.....dis 45 @ 45&10 %
Richardson's X-Cuts, No. 1, 30¢; No. 2, 27¢; No. 3, 24¢

Hack Saws—
Griffin's Hack Saws, complete.....dis 40&10 @ 50 %
Griffin's Hack Saw, Blades only.....dis 40&10 @ 50 %
Star Hack Saws and Blades.....dis 25 %
Diamond Hack Saws and Blades.....dis 25 %
Eureka and Crescent.....dis 25 %

Saw Frames.
White Vermont.....₩ gro $9 @ $10
Red, Polished, and Varnished....₩ doz $1.50, dis 25 %

Saw Sets.
Stillman's Genuine....₩ doz $5.00 and $7.75, dis 40&5 %
Stillman's Imita..₩ doz $3.25and$5.25,dis40&5@40&10%
Common Lever.....₩ doz $2.00, dis 40&5 %
Morrill's No. 1, $15.00; Nos. 3 & 4, $24....dis 40@40&5%
Leach's.....No. 0, $8.00; No. 1 $15.00, dis 15 @ 20&5 %
Nash's.....dis 20&10 @ 20&10&10 %
Hammer, Hotchkiss.....$5.50, dis 10 %
Hammer, Bemis & Call Co.'s new Patent....dis 30&5 %
Bemis & Call Co.'s Lever and Spring Hammer..dis 30&5 %
Bemis & Call Co.'s Plate.....dis 10 %
Bemis & Call Co.'s Cross Cut.....dis 12½ %
Aiken's Genuine.....$13.00, dis 50&10 %
Aiken's Imitation.....$7.00, dis 50&5 %
Hart's Patent Lever.....dis 20 %
Diamond, Star, 20. No. 15, $5.50, dis 30&10@20&10&10 %
Atkins' Lever.....per doz No. 1, $6.00; No. 2, $9.60
Atkins' Criterion.....per doz $7.50
Croissant(Keller),No.1,$15.00; No. 2,$24.00...dis 40&10 %

Saw Tools.
Atkins Perfection....$15.00; Excelsior $6.00 ₩ doz

Scales.
Hatch, Counter. No. 171, good quality.....₩ doz $21
Hatch, Tea. No. 161.....₩ doz $6.75 @ $7.00
Union Platform, Plain.....$2.10 @ $2.20
Union Platform, Striped.....$2.20 @ $2.30
Chatillon's Grocers' Trip Scales.....dis 50 %
Chatillon's Eureka.....dis 25 %
Chatillon's Favorite.....dis 40 %
Family Turnbull's.....dis 30@30&10
Richle B os.' Platform.....dis 45 %

Scale Beams.
Scale Beams, List of Jan. 12, 82..dis 50&10@50&10&5 %
Chatillon's No. 1.....dis 40 %
Chatillon's No. 2.....dis 50 %

Scrapers.
Adjustable Box Scraper (S. R. & L. Co...$6.50, dis 30&10 %
Box, 1 Handle.....₩ doz $4.00, dis 10 %
Box, 2 Handle.....₩ doz $6.00, dis 10 %
Reflector Box and Ship.....dis 20&10 %
Foot.....dis 50&10@60 %
Ship, Common.....₩ doz $3.50 net
Ship, Providence Tool Co.....dis 10 %

Screen Window and Door Frames.
Porter's Pat. Window and Door Frame...dis 33⅓&10 %
Screen Corner Irons. Warner's.....dis 35¼ & 33⅓&10 %
Stearns' Frames and Corners.....dis 25 @ 25&10 %

Screw Drivers.
Douglas Mfg Co.....dis 20&10&10 %
Disston's.....dis 45&10 %
Disston's Patent Excelsior.....dis 45&10 %
Buck Bros.....dis 30 %
Stanley R. & L. Co.'s Varnished Handles....dis 65&10 %
Stanley R. & L. Co.'s Black Handles.....dis 60&10 %
Sargent & Co.'s No. 1 Forged Blade....dis 60&10&10 %
Sargent & Co.'s Nos 20, 40 and 60.....dis 66⅔&10&10 %
Knapp & Cowles' No. 1.....dis 60&20 @ 70 %
Knapp & Cowles' No. 1 Extra.....dis 60 @ 60&10 %
Knapp & Cowles No. 00 & 4.....dis 50&5 @ 50&10&2 %
Stearns'.....dis 25&10&2 %
Gage & Parsons.....dis 35 %
Champion.....dis 2& 10 %
Clark's Patent.....dis 30 @ 33⅓ %
Crawford's Adjustable.....dis 30 %
Eilrich's Socket and Ratchet.....dis 25 @ 25&10 %
Allard's Spiral new Pat.....dis 25 %
Kolb's Connect Sense.....₩ doz $6, dis 25&10 %
Syracuse Screw-Driver Bits.....dis 30 & 30&5 %
Screw Driver Bits.....₩ doz. 50¢ @ 75¢
Screw Driver Bits, Parr's.....₩ gro @ 6.25
Gray & Hol. Hdle. Sets, No. 3, $12.....dis. 25 @ 25 & 5 %
P. D. & Co.'s, all Steel.....dis 50 %

Screws.
Wood Screws—List, Brass, Jan 27; Iron, July 1, 1887

Flat Head Iron.....dis 70 %	Ex. 10 % often given by jobbers.
Round Head Iron.....dis 65 %	
Flat Head Brass.....dis 65 %	
Round Head Brass.....dis 60 %	
Flat Head Bronze.....dis 65 %	
Round Head Bronze.....dis 60 %	

Machine—
Flat Head, Iron.....dis 55 %
Round Head, Iron.....dis 50 %
Bench and Hand—
Bench, Iron.....dis 55&10 @ 55&10&10 %
Bench, Wood, Beech.....$ dos $2.25
Bench, Wood, Hickory.....dis 20&10 %
Hand, Wood.....dis 25&10 @ 25&10&5 %
Lag, Blunt Point.....dis 75 @ 75&10 %
Coach and Lag, Gimlet Point.....dis 75 %
Bed.....dis 25&5 %
Hand Rail, Sargent's.....dis 66⅔&10 %
Hand Rail, Humason, Beckley & Co.'s..dis 70&10@75 %
Hand Rail, Am. Screw Co.....dis 75 %
Jack Screws, Millers Falls list.....dis 50 @ 50&5 %
Jack Screws, P. S. & W.....dis 35 %
Jack Screws, Sargent.....dis 60&10 @ 60&10&5 %
Jack Screws, Stearns.....dis 40 @ 40&10 %

Scroll Saws.
Lester, complete, $10.00.....dis 25 %
Rogers complete $4.00.....dis 25 %
Barnes' Builders' and Cabinet Makers', $15....dis 25 %

Scythe Snaths.....dis 50&2 %

Shears.
American (Cast) Iron.....dis 75&10 @ 75&10&5 %
Pruning.....See Pruning Hooks and Shears
Barnard's Lamp Trimmers.....$ dos $3.75
Tinners'.....dis 20&2 %
Seymour's, List, Dec., 1881.dis 60&10&10@60&10&10&10 %
Heinsch's, List, Dec., 1881..dis 60&10&10&60&10&10&5 %
Heinsch's Tailor's Shears.....dis 33⅓ %
First quality C. S. Trimmers.....dis 80@80&10 %
Second quality C. S. Trimmers..dis 80&10@80&10&10 %
Acme Cast Shears.....dis 10&10 %
Diamond Cast Shears.....dis 10&10 %
Clipper.....dis 10&10 %
Victor Cast Shears.....dis 75&10@75&10&5 %
Howe Bros. & Hulbert, Solid Forged Steel..dis 40 %
Cleveland Machine Co., Solid Steel Forged.....dis 70 %
Clauss Shear Co., Japanned.....dis 70 %
Clauss Shear Co., Nickeled, same list.....dis 60 %

Sheaves.
Sliding Door—
M. W. & Co., list July, 1888 .. ....dis 50&10 @ 60&5 %
R. & E., list Dec. 18, 1885.....dis 55&2 %
Corbin's list.....dis 60&10&2 %
Patent Roller.....dis 60&10&2 %
Patent Roller, Hatfield's.....dis 75 %
Russell's Anti-Friction, list Dec. 18, 1885..dis 60&2 %
Moore's Anti-Friction.....dis 60 %
Sliding Shutter—
R. & E. list Dec. 18, 1885.....dis 60&10&2 %
Sargent's list.....dis 60&10 %
Reading list.....dis 60&10&10 %

Ship Tools.
L. & I. J. White.....dis 20&5 %
Albertson Mfg. Co.....dis 25 %

Shoes, Horse, Mule, &c.
Horse—
Burden's, Perkins', Phœnix, at factory.....$4.00
Mule—Add $1 ₱ keg to above prices.
Ox, Wrought—
Ton lots.....₱ lb 9¢
1000 ℔ lots.....₱ lb 9½¢
500 ℔ lots.....₱ lb 10¢
Shot.—*Eastern prices, 2¢ off. cash, 5 days.*
Drop, ₱ bag, 25 ℔ ..... } Market
Drop, ₱ bag, 5 ℔ ..... } unsettled.
Buck and Chilled, ₱ 25-℔ bag ..... } See Trade
Buck and Chilled, ₱ 5 ℔ bag ..... } Report.

Shovels and Spades.
Ames' Shovels, Spades, &c., list Nov. 1, 1885....dis 20 %
NOTE.—Jobbers frequently give 5 @ 7½ % extra on above.
Griffith's Black Iron.....dis 50&10 %
Griffith's C. S.....dis 60 @ 60&10 %
Griffith's Solid Cast Steel R. R. Goods.....dis 20 %
Old Colony (Sanford Fork & Tool Co).....dis 20 %
St. Louis Shovel Co.....dis 20 @ 20&7½ %
Hussey, Binns & Co.....dis 15 @ 25 %
Hubbard & Co.....dis 20@20&7½ %
Lehigh Mfg. Co.....dis 50&10 %
Payne Pettebone & Son, list January, 1886....dis 30 %
Remington's (Lowman's Patent).....dis 30&10 @ 40 %
Rowland's, Black Iron.....dis 50&10 %
Rowland's Steel .....dis 60&5 @ 60&10 %

Shovels and Tongs.
Iron Head.....dis 60&10@60&10&5 %
Brass Head.....dis 60&10&10 %

Skeins, Thimble.
Western list.....dis 75&5 @ 75&10 %
Columbus Wrt. Steel, list Nov. 1, 1887.....dis 20 %
Coldbrookdale Iron Co .....dis 50&10 %
Utica P. S. T. Skeins .....dis 60 %
Utica Turned and Fitted.....dis 35 %

Sieves.
Buffalo Metallic, S. S. & Co., new list.. dis 50&25&10 %
Barler Flour Sifters .....₱ dos $2.00
Smith's Adjustable Sifters.....₱ dos $2.25
Smith's Adjustable Milk Strainer.....₱ dos $2.00
Smith's Adjustable F. & C. Strainer.....₱ dos $1.75

Sieves, Wooden Rim—	Iron.	Plated.
Mesh 18, Nested, ₱ doz.....	70¢	90¢
Mesh 20, Nested, ₱ doz.....	80¢	$1.00
Mesh 24, Nested, ₱ doz...	$1.00	1.10

Slates.—School, by case.....dis 50&10 %

Snaps, Harness, &c.
Anchor (T. & S. Mfg Co.).....dis 66 %
Fitch's (Bristol).....dis 50&10 %
Hotchkiss.....dis 10 %
Andrews.....dis 50 %
Sargent's Patent Guarded .....dis 70&10&10 %
German, new list.....dis 40&10 %
Covert.....dis 50&2 %
Covert, New Patent.....dis 50&2 %
Covert New R. E. .....dis 60&2 %
Covered Spring.....dis 60&10&10 %

Soldering Irons.
Covert's Adjustable list Jan. 1, 1886.....dis 35&2 %

Spoke Shaves.—Iron.....dis 45 %
Wood.....dis 30 %
Bailey's (Stanley R. & L. Co.).....dis 40&10 %
Stearns'.....dis 20&10 @ 30 %

Spoke Trimmers.
Bonney's.....₱ dos $10.00, dis 50 %
Stearns'.....dis 20&10 %
Ives'.....No. 1, $16.00; No. 2, $12.00 ₱ dos, dis 55&10 %
Douglass'.....₱ dos $9.00, dis 20 %

Spoons and Forks.
Tinned Iron—
Basting, Central Stamping Co.'s list.....dis 70&10 %
Solid Table and Tea, Central Stamping Company's list.....dis 70&10 %
Buffalo, S. S. & Co.....dis 33⅓&2 %
Silver-Plated—4 mos. or 5 % cash 30 days.
Meriden Brit. Co., Rogers.....dis 50 %
C. Rogers & Bros.....dis 50 %
Rogers & Bro.....50 %
Reed & Barton.....dis 50 %
Wm. Rogers Mfg. Co.....dis 50&10 @ 50&10&5 %
Simpson, Hall, Miller & Co.....dis 50&10 %
Holmes & Edwards Silver Co..dis 50&10 @ 50&10&5 %
H. & E. Silver Co, Mexican Silver.....dis 50&5 %
H. & E. Silver Co., Durham Silver .....dis 50&5 %
German Silver.....dis 50 @ 50&5 %
German Silver, Hall & Elton.....dis 50&5 %, cash
Nickel Silver.....dis 50&5@50&10&5 %, cash
Britannia.....dis 60 %
Boardman's Flat Ware.....dis 50&10 %
Boardman's Nickel Silver.....dis 50 %
Boardman's Brit'nia Spoons, case lots.....dis 60 %

Springs.
Elliptic, Concord, Platform and Half Scroll.....
.....dis 60 @ 60&5 %
Cliff's Bolster Springs .....dis 25 %

Squares.
Steel and Iron..... } .....dis 75 @ 80 %
Nickel Plated ..... }
Try Square and T Bevels.....dis 60&10&10 @ 70 %
Disston's Try Square and T Bevels.....dis 45&10 %
Winterbottom's Try and Miter .....dis 30&10 %
Starrett's Micrometer Caliper Squares..... dis 25 %

Staples.
Fence Staples, Galvanized } Same price as Barb Wire.
Fence Staples, Plain ..... } See Trade Report.

Steelyards.....dis 40&10@50 %

Stocks and Dies.
Blacksmith's, Waterford Goods....dis 30&5 @ 30&10 %
Lightning Screw Plate.....dis 25 @ 30 %
Reece's New Screw Plates.....dis 33⅓ @ 33⅓&5 %

Stone.
Hindostan No. 1, 3¢; Axe, 3½¢; Slips No. 1, 5¢..
Sand Stone.....₱ ℔, 2¢
Washita Stone, Extra.....₱ ℔, 2 1 @ 22¢
Washita Stone, No. 1.....₱ ℔, 15 @ 16¢
Washita Stone, No. 2.....₱ ℔, 11 @ 12¢
Washita Slips, No. 1, Extra.....₱ ℔, 40 @ 42¢
Washita Slips, No. 1.....₱ ℔, 30 @ 32¢
Arkansas Stone, No. 1, 4 to 6 in.....₱ ℔, $1.85
Arkansas Stone, No. 1, 6 to 9 in.....₱ ℔, $1.75
Turkey Oil Stone.....4 to 8 in., ₱ ℔ 40¢
Turkey Slips.....₱ ℔, $1.00 @ $1.50
Lake Superior, Chase.....₱ ℔, 16¢
Lake Superior Slips, Chase.....₱ ℔, 31@32¢
Seneca Stone, Red Paper Brand, ₱ ℔.....18 @ 20¢
Seneca Stone, High Rounds, ₱ ℔.....20 @ 25¢
Seneca Stone, Small Wheels, ₱ gro.....$24.00

Stove Polish.—Joseph Dixon's..₱ gro $6. dis 10 %
Gem.....₱ gro $4.50, dis 10 %
Gold Medal.....₱ gro $6.00, dis 25 %
"Mirror".....₱ gro $6.00, dis — %
Lustro.....₱ gro $4.75 net
Ruby.....₱ gro $3.75 net
Rising Sun, 5 gro. lots.....₱ gro $5.50
Dixon's Plumbago.....₱ ℔ 8¢ net
Boynton's Noon Day, ₱ gro. $5.00
Parlor Pride Stove Enamel.....₱ gross, $13
Yates' Liquid, 2 3 5 10 gal. cans
₱ gal... $0.90 .80 .70 .60
Yates Standard Paste Polish ,10-lb cans, per lb., 15 ¢
Jet Black.....₱ gro $3.50
Japanese.....₱ gro $3.50
Fireside.....₱ gro $2.50
Diamond O. K. Enamel.....₱ gro $10.00
Bonnell's Liquid Stove Polish .....₱ gro $4.00
Bonnell's Paste Stove Polish .....₱ gro $4.00
Black Eagle Benzine Paste, 5 and 10 lb. cans....12½¢
Black Jack Water Paste, 5 and 10 lb. cans.....12½¢
Nickel Plate Paste, per gross.....$3.00

Tacks, Brads, &c.
List Jan. 2, 1888.
American Iron Carpet Tacks.....dis 80 @ 80&5 %
Steel Carpet Tacks.....dis 80 @ 80&5 %
Swedes Iron Carpet Tacks.....dis 80 @ 80&5 %
American Iron Cut Tacks.....dis 75 @ 75&10 %
Swedes Iron Tacks .....dis 70&5 @ 75&10 %
Swedes Iron Upholsterers' Tacks.....
.....dis 75&10 @ 70&10&5 %
Tinned Swedes Iron Tacks.....dis 75&10 @ 70&10&5 %
Tinned Swedes Iron Upholsterers' Tacks.....
.....dis 75&10 @ 7 &1 &5 %
Gimp and Lace Tacks.....dis 75&10 @ 75&10&5 %
Tinned Gimp and Lace Tacks..dis 75&10 @ 75&10&5 %
Swedes Iron Trimmers' Tacks.dis 75&10 @ 75&10&5 %
Swedes Iron Miners' Tacks ....dis 70&10 @ 70& 0&5 %
Swedes Iron Bill Posters' or Railroad Tacks .....
.....dis 75& 0 @ 75&10&5 %
Swedes Steel Tacks all kinds (Swedes Iron price list)
.....dis 80 @ 80&5 %
Copper Tacks.....dis 5 &10 %
Copper Finishing Trunk and Clout Nails..dis 50&10 %
Finishing Nails .....dis 70&10 @ 70&10&10 %
Trunk and Clout Nails..dis 70&10 @ 70&10&10 %
Tin'ed Trunk and Clout Nails.dis 70&10 @ 70&10&10
Basket Nails.....dis 70&10 @ 70&10&10 %
Common and Patent Brads... dis 70& 0 @ 70&10&10 %
Hungarian Nails.....dis 70&10 @ 70&10&10 %
Chair Nails.....dis 70&10 @ 70&10&10 %
Zinc Glaizers' Points.....dis 50 @ 50&5 %
Cigar Box Nails .....dis 50&10 @ 50&10&5 %
Picture-Frame Points.....dis 50& 0 @ 50&10&5 %
Looking-Glass Tacks.....dis 50& 0 @ 50&10&5 %
Leathered Carpet Tacks.....dis 50&10 @ 50&10&5 %
Brush Tacks.....dis 50&10 @ 50&10&5 %
Shoe Finders', List Jan. 2, 1888. dis 10&10 @ 10&10&5 %
Lining and Saddle Nails, List Jan. 1, 1886:
Silvered.....dis 30&10&10 %
Japanned.....dis 20&10&10 %
Double-pointed Tacks.....80
Wire Carpet Nails .....dis 50&10 %
Wire Brads and Nails.....See Nails, Wire
Steel Wire Brads, K. & E. Mfg. Co.'s list.....dis 50&10 %
Tap Borers.—Common and Ratchet.....dis 20&10 %
Taper Tap Borers.....dis 33⅓&5 %
Enterprise Mfg. Co.....dis 20&10 @ 30 %
Clark's.....dis 33⅓ @ 35 %
Tapes, Measuring.—American.....dis 25&10 %
Spring.....dis 40 %
Chesterman's.....Regular list dis 25 @ 30 %
Thermometers.—Tin Case.....dis 80 @ 80&10 %
Thimble Skeins.—See Skeins.
Ties, Bale.—Steel Wire, Stan'rd list..dis 50&10&5 %
Tinners' Shears, &c.
Shears and Snips (P. S. & W.)..dis 20 @ 25 %
Punches—See Punches.
Snips, J. Mallinson & Co.....dis 33⅓ %
Tinware.
Stamped, Japanned & Pieced, list Jan. 20, 1888.....
.....dis 70&10 @ 70&10&5 %
Tire Benders, Upsetters, &c.
Stoddard's Lightning Tire Upsetters.....dis 15 %
Detroit Perfected Tire Bender.....dis 15 %
Tobacco Cutters.
Enterprise Mfg. Co. (Champion).....dis 20&10 @ 30
Wood Bottom.....₱ dos $5.00 @ $5.25
All Iron.....₱ doz $4.25
Nashua Lock Co.'s.....₱ dos $18.00, dis 50 @ 55 %
Wilson's.....dis 55 %
Sargent's.....₱ doz $24, dis 55&10 %
Arnes.....₱ doz $20.00, dis 40 %
Transom Lifters.
Wollensak's Iron Bronze, Crown, Star, Eagle and Shield.....
Wollensak's Bronze Metal, Class 3 and 4 .....dis 25 %
Wollensak's Brass Metal, Class 3 and 4 .....dis 35 %
Reiher's Bronzed Iron Rods list Jan. 1, 1887..dis 60&2 %
Reiher's Real Bronze or Nickel Plate, list Jan. 1, 1887.....dis 50&2 %
Excelsior.....dis 50&10&2 %
Shaw's.....dis 50&10
Payson's Universal.....dis 40 @ 40&10 %
Crown and Star.....dis 50&10 %
Traps.
Game—
Newhouse.....dis 35 @ 40&5 %
Oneida Pattern.....dis 70 @ 70&5 %
Game, Blake's Patent.....dis 40&10&5 %
Mouse and Rat—
Mouse, Wood, Choker.....₱ doz holes, 11@12
Mouse, Round Wire.....₱ doz $1.50, dis 10 %
Mouse, Cage, Wire.....₱ doz $2.50, dis 10 %
Mouse, Catch-'em-alive.....₱ doz $2.50, dis 15 %
Mouse, "Bonanza .....₱ gross $10 net
Mouse, Delusion.....₱ gross $18.00, dis 15 %
Rat, "Decoy ".....₱ gross $10.00, dis 10 %
Ideal.....₱ gross $10
Cyclone .....₱ gross $5.25
Hotchkiss Metallic Mouse, 5-hole traps...₱ dos 90¢
In full cases .....₱ doz 75¢
Trowels.—Lothrop's Brick and Plastering..dis 25 %
Reed's Brick and Plastering.....dis 15 %
Disston's Brick and Plastering.....dis 25 @ 25&10 %
Peace's Plastering.....dis 25 %
Clement & Maynard's.....dis 20 %
Rose's Brick.....dis 15 @ 20 %
Brade's Brick.....dis 25 %
Worrall's Brick and Plastering.....dis 20 %
Garden.....dis 70 %
Triers.—Butter and Cheese.....dis 25 %
Trucks, Warehouse, &c.
B. & L. Block Co.'s list, 1882 .....dis 40 %
Tubes, Boiler.—See Pipe
Twine.

	BC.	B.
No. 9, Flax Twine, ¼ and ⅛ ℔ Balls	22¢	50¢
No. 12, " " ¼ and ⅛ "	21¢	29¢
No. 18, " " ¼ and ⅛ "	18¢	28¢
No. 24, " " ¼ and ⅛ "	18¢	28¢
No. 36, " " ¼ and ⅛ "	16¢	27¢
No. 264, Mattrass, ¼ and ⅛ "	48 @ 50¢	
Chalk Line, Cotton, ¼ ℔ Balls		25¢
Mason Line, Linen, ¼ "		55¢
2-Ply Hemp, ¼ and ⅛ ℔ Balls (Spring Twine)		11¼¢
3 Ply Hemp, 1 ℔ Balls		12 @ 12½¢
3-Ply Hemp, 1¼ ℔ Balls		11 @ 11½¢
Cotton Wrapping, 5 Balls to ℔		15¢ @ 16¢
2, 3, 4 and 5 Ply Jute, ¼ ℔ Balls		10¢
Wood		6¼¢ @ 6¾¢
Paper		13¢ @ 14¢
Cotton Mops—6, 9, 12 and 15 ℔ to doz		18¢

Vises.
Solid Box. ... .dis 60 @ 60&5 %
Parallel—
Fisher & Norris Double Screw..... .....dis 15&10 %
Stephens'.....dis 25 @ 30 %
Parker's.....dis 20 @ 25 %
Wilson's.....dis 55 %
Howard's.....dis 40 %
Bonney's.....dis 40&10 %
Millers Falls.....dis 40 @ 40&10 %
Trenton.....dis 40&10 40&10 %
Merrill's.....dis 15@20 %
Sargent's.....dis 60&10&10 %
Backus and Union.....dis 40 %
Double Screw Leg.....dis 15&10 %
Prentiss.....dis 20&5 @ 25 %
Simpson's Adjustable.....dis 40 %
Saw Filers—
Bonney's, Nos. 2 & 3.....₱ dos $15.00, dis 40&10 %
Stearn's.....dis 33⅓&10 @ 33⅓&10&10 %
Stearn's Silent Saw Vises.....dis 33⅓ @ 35 %
Sargent's.....dis 66⅔&10 %
Hopkins'.....₱ dos $17.50 dis 10 %
Reading.....dis 40&10 %
Wentworth.....dis 20&10 %
Combination Hand Vise.....₱ gro, $42.00
Cowell Hand Vises.....dis 20 %
Bauer's Pipe Vises .....dis 10 %

Wagon Boxes.
Per lb .....9¼¢
Wagon Jacks.—Daisy .....₱ doz $4.00, dis 25 %

Washer Cutters.
Smith's Patent.....₱ dos $12.00, dis 20&10&10 %
Johnson's.....₱ dos $11.00, dis 33⅓ %
Penny's .....₱ doz Pol. $14 . Jap'd. $16. dis 55 %
Appleton's .....₱ doz $16.00, dis 60&10 %
Bonney's .....dis 30&10 %
Washers.

Size...	¼	5-16	⅜	½	⅝	¾	1
Washers....	7	5½	4¾	3¾	2¾	2¼	1¾

In lots less than 200 lb, ₱ ℔, add ½¢, 5-℔ boxes 1¢ to list
Wedges.—Iron. .....₱ ℔ 3½¢
Steel .....₱ ℔ 4 ¢
Well Buckets, Galvanized.
Hill's.....₱ doz ..12 qt., $4.25 ; 14 qt., $5.25
Iron Clad.....₱ doz., 14 qt., $4.25 @ $4.50
Whiting's Flat Iron Band.....₱ doz $4.25 @ $4.50
Whiting's Wired Top .....₱ doz $4.00 @ $4.25
Well Wheels—8 in., $2.25; 10 in., $2.70 ; 12 in., $3.25
Wire.
Iron—
Market, Br. & Ann., Nos. 0 to 18.....dis 70¢10&75 %
Market, Copp'red, Nos. 0 to 18 .....dis 70&70&5 %
Market, Galvanized, Nos. 0 to 18.....dis 65&5 %
Market Tin'd Tinned list Nos. 0 to 18 .....dis 67½ %
Stone Br. & Ann'd, Nos. 16 to 18, .dis 72½@72½&5 %
Stone, Bright & Ann'd, Nos. 19 to 26.....dis 75&75&5 %
Stone, Br. & Ann'd, Nos. 27 to 36.....dis 75&10&5 %
Stone, Tin'd, Tin'd list, Nos. 18 to 36...dis 70&70&10 %
Tinned Broom Wire, Nos. 18 to 24..dis 70 &70&10 %
Galvanized Fence.....dis 55 %
Annealed Fence, Nos. 8 & 9.....dis 75 %
Annealed Grape, Nos. 10 to 14.....dis 75 %
Brass list, Jan. 18, '84.....dis 15 @ 20 %
Cooper, list Jan. 18, 1884.....dis 20 @ 25 %
Baro Fence.....See Trade Report
Wire on Spools .....dis 65 %
Malin's Steel and Tinned Wire on Spools .....dis 40 %
Malin's Brass and Copper Wire on Spools .....dis 30 %
Cast Steel Wire.....dis 50 %
Stubs' Steel Wire.....$6.00 to $, dis 30 %
Steel Music Wire, Nos. 12 to 30.....55¢ ₱ ℔
Picture Wire.....dis 60&10 %
Barb Wire Safety Guards.....₱ 1000 $9.00, dis 25 %
Wire Clothes Lines. See Lines.
Wire Cloth, Netting, &c.
Painted Screen Cloth, No. 34, ₱ 100 sq ft.....$1.30
Painted Screen Cloth, No 33, ₱ 100 sq ft $2.00
Galvanized Wire Netting .....dis 70&10 @ 75 %
Wire Goods.—See Bright Wire Goods.
Wire Rope.—List May 1, 1886.....dis 33⅓ %
Wrenches.—American Adjustable.....dis 45 %
Baxter's Adjustable "S".....dis 40 % @ 50 %
Baxter's Diagonal.....dis 40&10 @ 50 %
Coes' Genuine.....dis 55&2 %
Coes' "Mechanics".....dis 55&10&2 %
Girard Standard .....dis 70&10 %
Machinists, Sterling Wrench Co.....dis 70&10 %
Lamson & Sessions Engineers'.....dis 60&10 %
Lamson & Sessions' Standard .....dis 70&10 %
Coes' Pattern, Wrought. }
Girard Agricultural ..... } .....dis 80 @ 80&5 %
Lamson & Sessions' Agricultural... }
Sterling Wrought.....
Bemis & Call's Patent Combination.....dis 35 %
Bem's & Call's Merrick's Pattern .....dis 35 %
Bemis & Call's Brigg's Patt.....dis 25 %
Bemis & Call's Cylinder or Gas Pipe .....dis 40&5 %
Remis & Call's No. 3 Pipe.....dis 35&5 %
Aiken's Pocket Bright.....$6.00, dis 50&10 %
The Favorite Pocket Bright).....₱ dos $4.00 dis 40¢
Webster's Patent Combination.....dis 25 %
Boardman's.....dis 2 &10 %
Always Ready.....dis 25&2 %
Alligator.....dis 50 %
Donohue's Engineer.....dis 50&10 %
Acme, Bright.....dis 50&3 %
Acme, Nickeled.....dis 50&3%
Walker's.....dis 55&3
Diamond.....dis 40 %
Diamond Patent Steel .....dis 40 %
Wringers, Clothes.
List Jan. 10 1888. $2.00 off.
Wrought Goods.
Staples Hooks, &c.. is Jan. 12, '87..dis 80&20@50&2 %

CURRENT METAL PRICES.

OCTOBER 31, 1888.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports.

IRON AND STEEL.

Bar Iron from Store.

Common Iron :
¾ to 2 in. round and square.. } ₩ lb 1.90 @ 2.00¢
1 to 6 in. x ⅜ to 1 in..... }
Refined Iron :
¾ to 2 in. round and square.. }
1 to 4 in. x ⅜ to 1½ in..... } ₩ lb 2.10 @ 2.2¢
4½ to 6 in. x ⅜ to 1 in..... }
1 to 6 in. x ¼ and 5-16 ..... ₩ lb 2.30 @ 2.4¢
Rods—⅜ and 11-16 round and sq.. ₩ lb 2.20 @ 2.3¢
Bands—1 to 6 x 3-16 to No. 12..... ₩ lb 2.80 @ 2.4¢
"Burden Best" Iron, base price.. ₩ lb 3.00 @ ... ¢
Burden's "H. B. & S." Iron, base price..... ₩ lb 2 80 @ ....¢
"Ulster"..... lb lb 3.10 @ ....¢
Norway Rods ..... 4.00 @ 5.00¢

Merchant Steel from Store.

Per pound.

Open-Hearth and Bessemer Machinery, Toe Calk, Tire and Sleigh Shoe, base price in small lots..... 2¼¢ @ 3¢
Best Cast Steel, base price in small lots 8¼¢ @ 9½¢
Best Cast Steel Machinery, base price in small lots..... 5½¢ @ 6¢

For Classification and Extras adopted by the Merchant Steel Association of the United States, June 1, 1888, see *The Iron Age*, June 21, 1888.

Sheet Iron from Store.

	Common American.		R. G. Cleaned.
10 to 16.....	₩ lb 2.75 @ 2.80¢	3.25 @	....¢
17 to 20.....	₩ lb 2.85 @ 3.00¢	3.25 @	3.50 ¢
21 to 24.....	₩ lb 3.00 @ 3.10¢	3.50 @	....¢
25 and 26.....	₩ lb 3 20 @	3.50 @	....¢
27.....	₩ lb 3.35 @ 3.37½¢	3.75 @	....¢
28.....	₩ lb 3.50 @ ....¢	4.00 @	....¢
	B. B.		2d qual.
Galv'd, 14 to 20,	₩ lb, 4.50 @ ...	4.88 @	....¢
Galv'd, 21 to 24,	₩ lb, 4.87½ @ ...	4.75 @	....¢
Galv'd, 25 to 26,	₩ lb, 5 25 @ ...	5.12 @	....¢
Galv'd, 27.....	₩ lb, 5.62½ @	5.48 @	....¢
Galv'd, 28.....	₩ lb, 6.00 @	5.85 @	....¢
Patent Planished.....	₩ lb A 10¢		B, 9¢
Russia.....	₩ lb 9½¢ @ 10¢		
American Cold Rolled B. B.....	₩ lb 5¢ @ 7¢		

English Steel from Store.

Best Cast.....	₩ lb 15 ¢
Extra Cast.....	₩ lb 16½ @ 17 ¢
Swaged, Cast.....	₩ lb 16 ¢
Best Double Shear.....	₩ lb 15 ¢
Blister, 1st quality.....	₩ lb 12½¢
German Steel, Best.....	₩ lb 10 ¢
2d quality.....	₩ lb 9 ¢
3d quality.....	₩ lb 8 ¢
Sheet Cast Steel, 1st quality.....	₩ lb 15 ¢
2d qualty.....	₩ lb 14 ¢
3d qualty.....	₩ lb 12½¢

METALS.

Tin.

	Per lb
Banca, Pigs.....	25¢
Straits, Pigs.....	25¢
English, Pigs.....	24½¢
Straits in Bars.....	26¢

Tin Plates.

Charcoal Plates.—Bright.

		Per box.
Melyn Grade.....	IC, 10 x 14.....	$6 00 @ $6.25
" "	IC, 12 x 13.....	6.25 @ 6.50
" "	IC, 14 x 20.....	6.00 @ 6.25
" "	IC, 20 x 28.....	12 50 @ 13.00
" "	IX, 10 x 14..	7.50 @ 7.75
" "	IX, 12 x 12.....	7.75 @ 8.00
" "	IX, 14 x 20.....	7.50 @ 7.75
" "	IX, 20 x 28.....	15 50 @ 16.00
" "	DC, 12½ x 17.....	5.75 @ 6.00
" "	DX, 12½ x 17... ...	7.25 @ 7.50
Call and Grade.....	IC, 10 x 14.....	6.00 @ 6 25
" "	IC, 12 x 12.....	6.25 @ 6.50
" "	IC, 14 x 20.....	6.00 @ 6.25
" "	IX, 10 x 14..	7.50 @ 7.75
" "	IX, 12 x 12.....	7.75 @ 8.00
" "	IX 14 x 20	7.50 @ 7.75
Allaway Grade.....	IC, 10 x 14.....	$5.87½ @ ...
" "	IC, 12 x 12.....	5.50 @ ....
" "	IC, 14 x 20.....	5.87½ @ ...
" "	IC, 20 x 28.....	11.50 @ ...
" "	IX, 10 x 14.....	6.25 @ ....
" "	IX, 12 x 12	6.50 @ ....
" "	IX, 14 x 20	6.25 @ ....
" "	IX, 20 x 28.....	13.00
" "	DC, 12½ x 17.....	.00 @ ...
" "	DX, 12½ x 17... ...	6.00 @ ....

Coke Plates.—Bright.

Steel Coke.—	IC, 10 x 14, 14 x 20.....	$5.00 @ ....
	10 x 20.....	7.50 @ 7.65
	20 x 28.....	10.25 @ ....
	IX, 10 x 14, 14 x 20.....	5.75
BV Grade.—	IC, 10 x 14, 14 x 20.....	4.60 @ ...

Charcoal Plates.—Terne.

Dean Grade.—	IC, 14 x 20.....	$4.62½ @ ...
	20 x 28.....	9 25 @ ....
	IX, 14 x 20.....	5.62½ @ ....
	20 x 28.....	11.37½ @ ....
Abecarne Grade.—	IC, 14 x 20.....	4.50 @ ....
	20 x 28.....	9.00 @ ....
	IX, 14 x 20.....	5.50 @ ...
	20 x 28.....	10.80

Tin Boiler Plates.

IXX, 14 x 26.....	112 sheets.....	$12.50 @ $12.75
IXX, 14 x 28.....	112 sheets....	12 75 @
IXX, 14 x 31.....	112 sheets	14.25 @

Copper.

Duty: Pig, Bar and Ingot, 4¢; Old Copper, 3¢ ₩ lb. Manufactured (including all articles of which Copper is a component of chief value), 45 % ad valorem.

Ingot.

Lake..... @ 18½¢
"Anchor" Brand..... @ 18 ¢

Sheet and Bolt.

Prices adopted by the Association of Copper Manufacturers of the United States, December 10, 1887, being quotations for all sized lots.

Not wider than	Not longer than	And longer than	Weights per square foot and prices per pound. Over 64 oz.	32 to 64 oz.	16 to 32 oz.	14 to 16 oz.	12 to 14 oz.	10 to 12 oz.	8 to 10 oz.	Less than 8 oz.
30	72	—	25	25	25	26	27	28	31	33
30	—	72	25	25	25	26	28	30	34	....
36	96	—	25	25	25	27	29	33	36	....
36	—	96	25	25	26	28	30	34	38	....
48	96	—	25	25	27	29	31	35	....	....
48	—	96	25	25	28	30	32	36	....	....
60	96	—	25	25	30	32	37	....	....	....
60	—	96	25	26	31	....	....	....	....	....
84	96	—	26	27	..	....	....	....	....	....
84	—	96	27	28	....	....	....	....	....	....
Over 84 in. wide			28	30	...	....	....	....	....	....

All Bath Tub Sheets.....	16 oz.	14 oz.	12 oz.	10 oz.
Per pound.....	$0.28	0.30	0.32	0 35

Bolt Copper, ⅝ inch diameter and over, per pound..... 25¢
Circles, 60 inches in diameter and less, 3 cents per pound advance over lowest prices of Sheet Copper of the same thickness.
Circles, over 60 inches diameter, up to 96 inches diameter, inclusive, 5 cents per pound advance over lowest prices of Sheet Copper of the same thickness.
Circles, over 96 inches diameter, 6 cents per pound advance over lowest prices of Sheet Copper of the same thickness.
Segment and Pattern Sheets, 3 cents per pound advance over price of sheets required to cut them from.
Cold or Hard Rolled Copper, 14 ounces per square foot and heavier, 1 cent per pound over the foregoing prices.
Cold or Hard Rolled Copper, lighter than 14 ounces per square foot, 2 cents per pound over the foregoing prices.

Copper Bottoms, Pits and Flats.

Per pound.

14 ounce to square foot and heavier..... 28¢
12 ounce and up to 14 ounce to square foot..... 29¢
10 ounce and up to 12 ounce..... 31¢
Circles less than 8 inches diameter 2 cents per pound additional.
Circles over 13 inches diameter are not classed as Copper Bottoms.

Tinning.

Tinning sheets on one side, 10, 12 and 14 x 48 each..... 8¢
Tinning sheets on one side, 30 x 60 each ..... 30¢
For tinning boiler sizes, 9 in (sheets 14 in. x 60 in.), each..... 15¢
For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each ..... 12¢
For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.) each..... 12¢
Tinning sheets on one side, other sizes, per square foot..... 2½¢
For tinning both sides double the above prices.

Planished Copper.

Planished Copper List May 5, 1888 ..... Net

Brass and Copper Tubes.

Seamless Copper.		Seamless Brass.	
⅝ inch ₩ lb.....	50¢	⅝ inch ₩ lb.....	47¢
½ " "	44¢	½ " "	41¢
⅝ " "	42¢	⅝ " "	39¢
¾ " "	40¢	¾ " "	37¢
⅞ " "	39¢	⅞ " "	36¢
1 " "	37¢	1 " "	34¢
1½ " "	34¢	1½ " "	31¢

Roll and Sheet Brass.

Discount from list..... 10 @ 15 %

Spelter.

Duty: Pig, Bars and Plates, $1.50 ₩ 100 lb.
Western Spelter..... 5½¢ @ 6¢
"Bergenport"..... 8¾¢
"Bertha"..... 7¾ @ 8¢

Zinc.

Duty; Sheet, 2½¢ ₩ lb.
600 lb casks..... 6¾¢
Per lb..... 7½¢

Lead.

Duty: Pig, $2 ₩ 100 lb. Old Lead, 2¢ ₩ lb. Pipe and Sheets, 3¢ ₩ lb.

American..... 4¼ @ 4½¢
Newark..... 4¼ @ 4½¢
Bar..... 5½¢
Pipe, subject to trade discount..... 7½¢
Tin-Lined Pipe, subject to trade discount..... 15¢
Block Tin Pipes, subject to trade discount..... 45¢
Sheet, subject to trade discount..... 8½¢

Solder.

½ @ ½ (Guaranteed)..... 16¢
Extra Wiping..... 13½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony.

Cookson..... ₩ lb 13¾ @ 14¢
Hallett s ..... " 11¾¢

Plumbers' Brass Work.

	Discount per cent.
Ground Bibbs and Stops.....	55&10&2
Ground Stops, Hydrant Cocks, &c.....	55&10&2
Corporation Cocks.....	55&10&2
Corporation Cocks, "Mueller" Pattern, from Western list.....	55&10&2
Ground Basin and Shampooing Cocks.....	50&10&2
Compression Basin Cocks	50&10&2
Compression Basin and Sink Cocks.....	50&10&2
Compression Pantry Cocks.....	50&10&2
Compression Double Basin and Shampooing Cocks	50&10&2
Compression Double Bath Cocks.....	50&10&2
Compression Bibbs, Urinal Cocks, Sill Cocks, Stops, Hopper Cocks, Hydrant Cocks and Ball Cocks.....	50&10&2
Basin Plugs and Basin Grates.....	55&10&2
Bath and Wash Tray Plugs.....	55&10&2
Bath Wastes and Washers, Bath and Basin Valves, Sewer and Vacuum Valves, Cistern Valves, Pump Valves and Strainers, Ship Closet Valves and Suction Baskets.	55&10&2
Basin Clamps, Basin Joints and Strainers	55&10&2
Boiler Couplings, Ground Face, per set $1.25..	dis 10
Boiler Couplings, Plain Face, per set $1.20..	dis 10
Water Back Valve and Plain Couplings, Soldering Nipples and Unions.....	55&10&2
Union Joints.....	60&10&2
Hydrant Nozzles, Handles and Guides, Sockets and Clamps, Street Washer Screws and Guides.....	55&10&2
Hose Goods	55&10&2

Steam and Gas Fitters' Brass and Iron Work.

	Discount per cent.
Brass Globe Valves.....	60&10&2
Finished Brass Globe Valves, with Finished Brass Wheels.....	40&10&2
Brass Globe Valves, with Patent Wood Wheels.	60&10&2
Brass Globe Angle and Corner Valves.....	60&10&2
Brass Radiator Angle Valves.....	60&10&2
Brass Radiator Angle Valves, Frink's Patent.	60&10&2
Brass Cross and Check Valves.....	60&10&2
Brass Check Valves.....	60&10&2
Brass Hose Valves.....	60&10&2
Brass and Iron Frink Valves	60&10&2
Brass Safety Valves.....	60&10&2
Brass Vacuum Valves.....	50&10&2
Brass Whistle Valves.....	60&10&2
Brass Balance, Back Pressure and Foot Valves.	50&10&2
Brass Butterfly and Throttle Valves.....	50&10&2
Brass Pump Valves.....	50&10&2
Brass Steam Cocks.....	57½&10&2
Brass Service, Meter and Union Meter Cocks.....	57½&10&2
Brass Whistles, Water Gauges and Oil Cups.	60&10&2
Brass Hollow Plug, Tallow and Globe Oil Cups.	50&10&2
Brass Lubricators.....	60&10&2
Brass Air Valves.....	60&10&2
Brass Air Cocks.....	60&10&2
Brass Gauge Cocks.....	55&10&2
Brass Cylinder Cocks and Steam Bibbs..	50&10&2
Brass Swing Joints and Expansion Joints.	50&10&2
Brass Test Pumps.	50&10&2
Brass Steam Fittings, Rough.....	60&10&2
Brass Steam Fittings, Finished..	20&10&2
Brass Union Joints.....	60&10&2
Brass Soldering Unions and Nipples ...	55&10&2
Brass Hose Fittings, Fusible and Boiler Plugs.....	55&10&2
Iron Body Globe, Angle, Cross and Check Valves	65&10&2
Iron Body Safety, Throttle, Back Pressure, Butterfly and Foot Valves.....	65&10&2
Iron Cocks, all Iron	65&10&2
All Iron Valves.....	65&10&2

Miscellaneous.

	Discount per cent.
Cast Iron Fittings.....	70&10
Plugs and Bushings	75&10
Malleable Iron Unions.....	67½
Malleable Iron Fittings.....	35

Paints.

Black, Lamp—Coach Painters'.....	₩ lb 22 @ 24¢
" Ordinary.....	6¢
Black, Ivory Drop, fair.....	12 @ 15¢
" " best.....	28¢
Black Paint, in oil.....kegs, 8¢; assorted cans,	11¢
Blue, Prussian, fair to best...	40 @ 55¢
" " " in oil.....	45 @ 55¢
" Chinese dry	70¢
" Ultramarine.....	18 @ 30¢
Brown, Spanish.....	13½¢
" Van Dyke.....	10 @ 12¢
Dryers, Patent American..ass'd cans, 8¢; kegs, 7¢	
Green, Chrome	15 @ 23¢
Green, Chrome in oil.....	14 @ 18 @ 25¢
Green, Paris.....	good, 20¢; best, 25¢
Green, Paris in oil	good, 30¢; best, 35¢
Iron Paint, Bright Red.....	₩ lb 2½¢
Iron Paint, Brown	₩ lb 1½¢
Iron Paint, Purple	₩ lb 3¢
Iron Paint, Ground in oil, Bright Red....	₩ lb 6½¢
Iron Paint, Ground in oil, Red	₩ lb 5½¢
Iron Paint, Ground in oil, Brown.....	₩ lb 5½¢
Iron Paint, Ground, Purple.....	₩ lb 6¢
Litharge.....	6½¢
Mineral Paints..	2 @ 4¢
Orange Mineral.....	10¢
Red Lead, American.....	6½¢
Red Venetian (Eng.) dry.....	$1.65 @ $1.70
Red Venetian in oil.....ass't'd cans, 11¢ ; kegs, 8¢	
Red Indian Dry.	9 @ 12¢
Rose Pink...	10 @ 13¢